THE JOURNAL OF PARAPSYCHOLOGY

Volume 12 JUNE, 1948 Number 2

UNIV. OF MICH.

PAGE

Announcement of the New Advisory Board 81

Symposium: A Program for the Next Ten Years of Research in Parapsychology 83

Psychoanalysis and Parapsychology 83
JULE EISENBUD

A Suggested Program for Parapsychology 86
E. P. GIBSON

A Program for the Investigation of Psychometry 90
J. HETTINGER

A Ten-Year Program for Parapsychology 96
BETTY M. HUMPHREY

Research Aims for the Decade Ahead 101
J. B. RHINE

Research Projects in Parapsychology 107
GERTRUDE R. SCHMEIDLER

A Program of Parapsychology 113
ROBERT H. THOULESS

Suggestions for Experiments in Parapsychology 119
R. WARCOLLIER

Some Basic Problems for Parapsychological Research 123
J. L. WOODRUFF

Spontaneity as a Factor in ESP 126
WALLACE B. SCHERER

Comments

Independent Discoveries of Target Preference in PK Data 148

Book Reviews

The Religion of the Modern Scientist by S. W. Tromp 151
H. H. PRICE

Spiritism or Parapsychology? by A. Spesz 152
JAN EHRENWALD

Glossary 153

A SCIENTIFIC QUARTERLY DEALING WITH EXTRASENSORY PERCEPTION, THE PSYCHOKINETIC EFFECT, AND RELATED TOPICS

DUKE UNIVERSITY PRESS
DURHAM, N. C.

The Journal *of* Parapsychology

EDITORS

J. B. RHINE, J. G. PRATT, and BETTY M. HUMPHREY, *Editors*
J. A. GREENWOOD and T. N. E. GREVILLE, *Statistical Editors*
DOROTHY H. POPE, *Managing Editor*

ADVISORY EDITORIAL BOARD

HORNELL HART
Duke University

H. H. PRICE
University of Oxford

GARDNER MURPHY
College of the City of New York

ROBERT H. THOULESS
University of Cambridge

This JOURNAL is published on the fifteenth day of March, June, September, and December by Duke University Press, Durham, North Carolina.

Contributions submitted for publication and all editorial communications should be addressed to the Managing Editor, Dorothy H. Pope, College Station, Durham, North Carolina. Correspondence with the editors is advised before submitting articles other than reports of experimentation. Since it does not forward manuscripts by registered mail, the JOURNAL cannot guarantee that they will not be lost in transit, and contributors are urged to keep copies of their papers. All contributions should be typewritten, double spaced. References should be given in the form adopted by the JOURNAL.

Reprints may be ordered when the proof is returned. The JOURNAL will bear one half the cost of reprints up to two hundred copies. Correspondence concerning subscriptions, change of address, back numbers, and other business communications should be addressed to Dorothy H. Pope, College Station, Durham, N. C.

The subscription price is $5.00 a year; single current numbers $1.25. The rate for back volumes is $6.00; for single numbers $1.50. Missing numbers will be supplied free when lost in the mails if written notice is given within one month of the date of issue. All remittances should be made payable to the JOURNAL OF PARAPSYCHOLOGY.

Entered as second class matter May 21, 1942, at the post office at Durham, N. C., under the act of March 3, 1879.

DUKE UNIVERSITY PRESS

The Journal *of*
Parapsychology

Volume 12 JUNE, 1948 Number 2

ANNOUNCEMENT OF THE NEW ADVISORY BOARD

As a step toward making the Journal more broad and international in its orientation we have been drawing for advice and cooperation through the years upon a wide circle of competent contributors. It seems appropriate that we acknowledge the participation of the more active of these counsellors, and we have asked four of them—Dr. Hornell Hart, Dr. Gardner Murphy, Professor H. H. Price, and Dr. Robert H. Thouless—to serve on an advisory editorial board. They have consented, and their names will hereafter appear in that capacity in the register of the Journal staff.

These four men are already too well known, not only in their own professional fields but in parapsychology as well, to require any introduction to older students and readers. For the benefit of newcomers to our pages, however, we add a few words about each of them.

Dr. Hart is Professor of Sociology at Duke University. He has long been a student of parapsychology and a member of the Research Committee which assisted for many years in the administration of the Parapsychology Laboratory at Duke. He has lectured, written, and experimented on parapsychological problems.

Dr. Murphy is Chairman of the Department of Psychology at the College of the City of New York, and First Vice-President, Trustee, and Chairman of the Research Committee of the American Society for Psychical Research. He has been active in para-

psychological work since he held the Hodgson Fellowship at Harvard in the early twenties and has contributed many articles, both experimental and theoretical, to this field of research.

Professor Price is Wykeham Professor of Logic at the University of Oxford and was formerly President of the Society for Psychical Research, London. He has been for years a member of the Council of the Society and has written and lectured about parapsychology on numerous occasions.

Dr. Thouless is Reader in Educational Psychology at the University of Cambridge and was President of the Society for Psychical Research for three years. He also has been for many years a member of the Council and has contributed to the field liberally in the form of experimental work and published articles.

It is thus very evident that we have in the counsel of these men the benefit of a rare combination of experienced judgment in parapsychological matters and of wide-ranging academic scholarship. This more official association with the members of the Advisory Board should give an increased breadth of editorial vision to our efforts and should result in a better JOURNAL.

The Advisory Board cannot, of course, be held responsible for the editorial policy of the JOURNAL, but the advice of its members will be sought and followed in the many difficult decisions that publication in this developing field of research forces upon us. We shall continue, of course, to welcome from our readers suggestions for the improvement of the educational role which this periodical is designed to play.—Ed.

It was announced in the last number of the *Parapsychology Bulletin* that the June JOURNAL would contain an appreciation and review of the work of the late Whately Carington by Fraser Nicol. The manuscript arrived from England too late to get into this number; it will appear in September.

SYMPOSIUM: A PROGRAM FOR THE NEXT TEN YEARS OF RESEARCH IN PARAPSYCHOLOGY

PSYCHOANALYSIS AND PARAPSYCHOLOGY

By JULE EISENBUD

Dr. Eisenbud, a practicing psychoanalyst and Associate in Psychiatry at the Columbia College of Physicians and Surgeons, is a trustee of the New York Psychoanalytic Institute and of the American Society for Psychical Research. He has published four articles dealing with instances of telepathy encountered in psychoanalysis.—Ed.

PROGRESS in science is frequently dependent on the cross-fertilization of two disciplines, whose individual genetic lines have become too inbred. I believe, to switch the metaphor, that the time is ripe—even over-ripe—for psychoanalysis and parapsychology to begin to take in each other's wash. To what degree and in what way would psi functions, now generally conceded to be largely unconscious in their operation, fit into the evolving picture of human behavior being drawn by psychoanalytic research, and to what degree and in what way would the application of psychoanalytic constructs illuminate the data of parapsychology?

Psychoanalysis has always professed a thoroughgoing determinism in its approach to intra- and interpersonal relationships, its main field of investigation. But as in other sciences which are both holistic and deterministic in outlook, the data of psychoanalysis rarely reveal themselves as quite whole or as completely determined. There are always huge gaps which are generally glossed over by extrapolative processes whose legitimacy is taken for granted. Would the assumption of psi contribute measurably to the filling-in of these gaps?

In order to answer this it would be advantageous, at least in the exploratory stages of inquiry, to free the psi hypothesis from its present rather tight moorings in a framework of limited range and to make the bold assumption that if psi exists, it may very well

exist as a pervasive and omnipresent thread in the fabric of things, a thread, however occult its manifestations, to be searched for in every nook and corner of psychobiological functioning and interpersonal relationships. With this assumption, we could approach the study of human behavior to see how far it is possible to delineate presumptive lines of determinism in areas which are now underdetermined or where the chance factor still looms large. Freud, utilizing the assumption of the dynamic unconscious, did exactly this when he showed the determinism behind everyday behavior, dreams, character formation, neurotic symptomatology (mental, behavioral, and physical) and the seemingly chaotic productions of the mentally ill.

With the use of the psi hypothesis, the web of determinism could probably be drawn even tighter in these areas, as Freud himself was one of the first to demonstrate. In so doing, however, it would have to be borne in mind constantly that the objective of such research would not be to prove the existence of psi but simply to apply the reasonably valid assumption of psi in areas where proof itself, according to conventional notions, would at present be difficult or impossible to obtain.

One need not, naturally, abandon every trace of methodological caution, but one would have to relinquish to a considerable extent the security of precisely measurable probability situations and take the data as and where it turned up. Methodologically this might appear to be a regression to the anecdotal-documentary stage of psychical research, but actually the regression would occur only in one plane, as in a spiral, while progression continued in another. In any case, a demonstrable critical ratio favoring the existence of psi should no longer be required from each and every instance in which the operation of psi is posited any more than the rather complicated proof of the existence of electrons is now required each time the electronic hypothesis is put to use. There will be time enough after the untidy preliminary explorations to press for analytical and experimental studies designed to refine working methods and concepts. With larger numbers of psychoanalytically trained investigators (and to enlist these should be one of the main objectives of the next few years) it should be possible to plan frequency and proba-

bility studies on dream material, hypnotic experiments, genetic personality studies, and even animal experiments to test the validity of the clinical use of the psi hypothesis. Ultimately large-scale studies might be undertaken to map out the relationship between psi functions and the organism-as-a-whole. At present, however, we must accept our limitations and use whatever tools we have in the most imaginative way possible. We must remember that all hypotheses are born in bastardy, while second or third generation assumptions are frequently of the elite.

As to the use of psychoanalytic concepts within the framework of more formal parapsychological studies, I am inclined to believe that for the present the two most fruitful lines of investigation might be: (1) the study of the deeper emotional (adaptive) needs of the subject, particularly as they operate in the transference relationship to an investigator as well as to a group (and vice-versa); and (2) the dynamic aspects of the ego's repressive process, particularly in relation to the construction of experimental set-ups for the detection of psi and the interpretation of data in spontaneous cases. The first line of investigation might be of value in helping us to understand and control the apparently capricious nature of the results of standard laboratory experiments and might provide some insight into the almost universally observed decline effects. It might also be helpful in illuminating many obscure areas in past and present mediumistic work. The second line of investigation might enable us better to comprehend the significance of apparent errors and misses in the emergence of psi responses, not as evidence of the loose, uncontrollable and inaccurate nature of the psi response itself (a preconception widely held), but as the perhaps exquisitely specific end result of a repressing and distorting ego.

This point of view could be applied not only to drawing experiments (as Warcollier has attempted) but to other experiments as well in which the subject is able to make free plastic use of a set of response possibilities, and especially in hypnotic and mediumistic studies. With this concept in mind, also, different end points for the detection of genuine psi responses could be developed for both experimental work and the analysis of spontaneous data. We might thus get away from the limitations of veridicality and establish

empirical bases for the use of various behaviorisms, physiological changes, and symbolic thought equivalents as suitable end points instead of demanding, as we now tend to do, a straight and undistorted one-to-one structural correspondence between target and response.

I should be loath to conclude without suggesting one other possible use for the psychoanalytic approach in a period so important to the development of parapsychology as the present: as a means of investigating more deeply the fundamental nature of the irrationally phobic (passing as critical) attitude of the world toward parapsychology and parapsychologists, and the equally irrational and phobic (passing as critical) attitude of parapsychologists toward each other. Unless we are able through insight to gain some mastery of the destructive forces threatening from without and within, much of our best creative energies will be wasted in areas of no scientific consequence. All too unfortunately, our task is difficult enough without this.

A SUGGESTED PROGRAM FOR PARAPSYCHOLOGY

By E. P. Gibson

Mr. Gibson is an engineer who was for several years Record Librarian of the Parapsychology Laboratory. He has published sixteen articles, most of which are reports of his own experimental work in parapsychology or of spontaneous psi experiences.—Ed.

A program involving research in parapsychology over the next ten years is rather an ambitious undertaking and no doubt one which is subject to many necessary modifications as the time passes. These modifications may take place as new experimentation leads to new avenues of approach and as financial circumstances increase facilities for experimentation. I should prefer to confine myself to a few suggestions of what seem to me to be the more promising leads to the subject.

It would seem unwise for the experimental laboratory to discontinue the present quantitative exploration into ESP and its ramifications in time, such as precognition and retrocognition, and

into the phenomenon of PK. Continuance of such research is no longer needed to prove that these capacities exist, but the delicate methods which have been evolved make excellent exploratory techniques for locating new experimental subjects in these fields. A steady and persistent search for new subjects possessing the ability to use these capacities should be maintained at all times. It may seem wise, if and when such subjects are found, to abandon the quantitative approach and widen the investigation to include qualitative material such as has been used in experiments in psychometry; and in the PK field, to endeavor to obtain direct pointer readings on delicate apparatus.

Promising ESP subjects might be induced to attempt various forms of automatism, such as scrying, automatic writing, etc. for the purpose of freeing the unconscious mind of the restraints of the conscious. Likewise deep hypnosis might also be used upon suitable subjects for the same purpose. While hypnosis of late has not yielded the purported results of the early hypnotists and mesmerists, it would seem worth while to continue experimental work in this field, with every attempt being made by both qualitative and quantitative methods, to utilize good ESP subjects and natural somnambules wherever possible. Every effort should be made to achieve the depth of trance necessary to release the paranormal functioning.

A field for immediate study which has already been proposed for research and which can be approached from the quantitative and qualitative angles is that of water divining or dowsing. It would seem that in this field the experimenter has an unequalled opportunity to investigate a spontaneous and automatic activity which has been recurrent for centuries.

In studying the qualitative phenomena, if and when such material is unearthed, it might be advisable upon occasion to give such material a free field of activity and see what will be produced by the deeper strata of the mind when its expression is not canalized. It will be remembered that the remarkable series of concordant automatisms and cross-correspondences which occurred between various participants in the English study of mediumship during the first two decades of this century was largely a product of the automatisms

themselves and not the plan of the experimenters. An attempt in the early period to have held these creations inside a given scheme might have prevented the emergence of the intricately woven material which did emerge. The human unconscious has not been drained; it is only beginning to be understood in a limited way, and an attempt to provoke emergence of cognitions from deep levels by any means will be worth while and worthy of the cooperation of psychiatrist and psychoanalyst as well as the parapsychologist.

A study of reputed psychics with purported paranormal powers should be instituted. These psychics should be assured that they will not be "smeared" in any report if the experimentation is a failure. It is unlikely that many of the reputed psychics will offer themselves for experimentation unless they possess some measure of belief in their own powers. New methods of control are now available, and certain so-called "séance" conditions can be maintained for the psychic at the same time that adequate experimental control is provided. If material emerges in a spiritistic form, there seems to be no point in interpreting it to the subject in the equally fluid terminologies of psychoanalysis and psychiatry, whatever the preconceptions and opinions of the experimenter may be. It seems probable to the writer that the failure of parapsychology to progress in its early stages may be laid in part at least to the paranoid atmosphere of suspicion directed to subject and experiment alike by some of the early researchers themselves. Unfortunately, this spirit still seems to be present in the motivation of some present-day investigators. If results are equivocal—and they often are apt to be—experimentation should be continued as far as possible to render them clear-cut.

In the experiments of Dr. Christian Winther of the Danish Polytechnic Academy, results were reported to have been obtained in psychokinesis by a trance medium. In these experiments qualitative results of the equivalent value of "pointer readings" were obtained. These experiments were subject to improvement in experimental method and equipment. If, as suggested in the *Parapsychology Bulletin* for December, 1947, the new and better-controlled experimentation with the medium Anna Rasmussen yields a successful result, attempts should be made to conduct similar quali-

tative experiments with physical mediums in this country. It is reported that during the last century D. D. Home, in full light and under better control, demonstrated similar phenomena for Sir William Crookes. If and when such phenomena recur, ideas for experiment will occur to every parapsychologist, physicist, and biologist interested in this program of research, and PK can be studied in relation to problems of motion, growth, physiology, and general biology.

The parapsychologist should endeavor to free himself as much as possible from a priori assumptions and biases which are apt to influence the experimental situation. It has not been many years since the mention of physical phenomena was in bad taste in two of the foremost psychical research organizations of the English-speaking world. Let us be exceedingly careful to free ourselves from new taboos and new assumptions which may affect the experimental approach and modify the results.

I want to stress that what we should most strive for is to stay clear of current psychological dogmas and preconceptions and, if necessary, use a new vocabulary to free ourselves from their limitations.

It might be worth while for the parapsychologist always to be on the lookout for other extramural phenomena which reputedly occur from time to time, such as poltergeist activity and hauntings. While these phenomena, when investigated, often fail to yield anything of significance, some rare cases have yielded exceptionally interesting material. What the full potentialities of a well-trained, docile poltergeist might be are yet to be ascertained. They might change the fate of nations.

Looking back on the foregoing, it seems that I would stress as much as possible the discovery and development of the exceptional paranormal subject. Granted such, the field of quantitative study will widen enormously. It has already attracted the attention of cooperating biologists, physicists, mathematicians, psychoanalysts, and psychiatrists. Eventually, finding himself in almost complete isolation with a few of the shades of the nineteenth century materialists, the orthodox psychologist might be enticed into cooperation.

A PROGRAM FOR THE INVESTIGATION OF PSYCHOMETRY[1]

By J. HETTINGER

Dr. Hettinger, an engineer by profession, received from London University the first doctorate degree ever awarded for work in parapsychology in Great Britain. He has written two books and ten articles covering his work in this field.—Ed.

EXPERIMENTAL parapsychology is nowadays the main driving force of the progress of parapsychology. Hopes are being entertained that by following a well-defined and practical program its progress may be accelerated. Having been asked, together with others, to express my views on such a program, I will endeavor to do so, although the contribution that I can make is a limited one.

Let me first of all shortly delineate the background of my attitude to the subject as a whole.

I hold no brief for psychic phenomena of a purely physical nature, for none of the séances that I have attended ever impressed me favorably. On the other hand, those of a mental character, although often intermingled with our ordinary mental processes, convinced me that they are manifestations of an indisputable transcendental reality. This conviction grew so strong, and the realization of the importance of the phenomena so intense, that after many peregrinations I decided to undertake their scientific investigation.

Weighing in my mind as to which one of the various manifestations best lends itself to such an investigation from a practical point of view, my choice fell on psychometry. For nearly fifteen years now, since that choice was made, I have concentrated my research efforts exclusively on this particular phenomenon, and I still consider it the most promising one for scientific investigations. But, having said this, let me add that it must not be inferred therefrom that in my view the program of research in parapsychology should be limited to that which I have to suggest. On the contrary, I sincerely hope that those who have pursued and studied other lines of inves-

[1] Free association to a token object involving clairvoyance.

tigation will put forward practical plans concerning their own specific suggestions.

Searching for a program, I kept in mind the following two important points: (a) What is the object of the contemplated experiment? and (b) Does the method to be used stand any chance of attaining that object?

I do not propose to cover the whole range of possible psychometric investigations, but only those which, in view of my own experience, I consider to be the ones most likely to yield immediate and useful results relevant to the carrying-on of further inquiries.

1. *Finding and training of sensitives.* Sensitives who have the psychometric ability are the indispensable instruments for this specific range of investigation. They may be professional mediums or nonprofessionals who possess the necessary basic psychic sensitivity but have not tried to develop it so as to be able to exercise it at will. Both can be tested by using pictures as the stimulus material according to the method described in *Exploring the Ultra-Perceptive Faculty.*[1] Irrespective of the degree of sensitivity found to be present, steps should be taken to improve the ability in the professionals. This could be carried out in two ways:

(a) A subject peruses an illustrated magazine, or preferably a scrapbook of collected illustrations with one picture per page, and the sensitive (actual or potential) gives his impressions as they come, without any elaboration. The perusal by the subject should be quite normal, without any concentration on transmission; the sensitive should touch, or be in the near presence of, an article belonging to the subject. If subject and sensitive are in the same room, the article need not be used; the subject himself acts as the psychometric object. However, it may be an advantage to get accustomed to working with an article instead of the presence of the subject for the sake of all the subsequent experiments to be carried out at a distance, which seem to require the use thereof. In preliminary stages of the work for developmental purposes, as the sensitive gives his impressions, the subject should each time inform him if they are correct or not; and if they are in any way distorted or in the form of some interpretation or inference, he should refer

[1] J. Hettinger (Rider & Co., 1941).

to it and ask for the sensitive's comments, if they can readily be offered.

(b) According to a second method, suitable for a class in developing the ability, a number of subjects sit in one room, and one or more sensitives (actual or potential) give their impressions in another room, the two rooms being interconnected by loud-speaking telephones. Rapport between the subjects and the sensitives is established by the use of articles belonging to one or more subjects, as may be arranged. A series of pictures are thrown on a screen or are suitably displayed in the subjects' room at the rate of, say, one per minute, and the sensitives keep giving their impressions, which are heard in the classroom and responded to as indicated under (a).

2. *Ascertaining and investigating facts by the inductive method.* When a number of suitable sensitives have been found among professionals and nonprofessionals, the next work to be undertaken ought to be concentrated on ascertaining and investigating as many facts as possible by the inductive method which combines prima facie evidence and the frequency with which this evidence occurs. For the purpose of this method it is essential that the sensitive shall know neither the intended purpose of the experiments nor the stimulus material, the latter being always pictorial, and sometimes having reading matter associated with it. No rules can be laid down as to how frequently correspondences must occur before they are definitely accepted as establishing the fact of the sensitive's success; this will depend to a great extent on the general or exceptional character of the stimuli and of the impressions, and will have to be left to the judgment of the experimenter.

Here are some of the fundamental facts, the probing of which, in view of my own findings, is likely to yield corroborative results.

(a) *Perception of colors.* These are often perceived correctly, but sometimes they are interchanged; for example, blue may be taken as green, and vice versa. Interchange of colors may also be due to associations; for example, a white and black illustration of a fire may produce the impression, "red," and a similar picture of fields or trees the impression, "green." There is also a tendency for an exceptionally striking colored picture to be correctly described

as to its actual content, apart from color, not at the actual time of perusal but a few minutes later.

Careful analysis of such instances may lead to useful interpretations helpful in the organization of further lines of research likely to provide us with more facts.

(b) *Perception of latent speech.* Words read in a text mentally, and not orally, or written down during the test, are sometimes repeated by the distant sensitive. A few from my own experiments are: "fluffy," "Glasgow," "flight." Very exceptionally, a snappy sentence also comes through, such as: "There you are."

I suggest that special stimulus material be prepared in the form of study books of about thirty pages, each page containing one or more paragraphs estimated to be read in one minute and including a few exceptional words which are preferably repeated two or three times. The subject should also write down these words during his perusal of the material.

A sufficiently long series of successful tests along these lines may provide us with an adequate collection which will be a definite proof that latent speech is transmitted in the rapport between a sensitive and a distant subject.

(c) *Occurrence of time lag.* In addition to impressions corresponding in substance and time, we get impressions corresponding in substance but lagging in time with the material perused. It was lately found that this lag occurs with a definite regularity: for instance, in the case of one subject, it was found that the lag interval was three minutes, with quite a number of delayed impressions, while in the case of another subject that delay was six minutes. In the past I was more or less inclined to disregard impressions which were delayed more than one minute, unless they were of quite an exceptional character. I now feel, however, that at least those which occur with the same regularity in one and the same test—for example, with a three-minute interval between picture perused and impression given—ought to be accepted in a class of their own, and the delayed impressions studied with respect to different subjects and sensitives.

(d) *Associations.* Subconscious associations which do not seem

to emerge in the conscious are often revealed upon subsequent comparison of the impressions with the stimulus material. Personal analysis of such associations by the subject concerned may bring to light some valuable information concerning the part played by the subconscious in the modus operandi of these transcendental phenomena. Since sensitives also seem to produce these associations, possibly some of them—especially those who are psychologists or psychology students—could make a contribution in this respect too.

(e) *Inferences and interpretations.* When these occur exactly in time, they are now and then very striking so that it is difficult to disregard them as being due to chance coincidence. Moreover, they seem to involve a kind of pithy reasoning which summarizes the situation neatly and concisely in a most convincing way. Such inferences and interpretations deserve careful analysis in the hope that one day some investigator may succeed in finding out the underlying mentation, which would indeed be an important discovery.

(f) *Dispensing with the psychometric object.* The following tests are intended to ascertain the necessity of using a psychometric object and the circumstances in which it can be dispensed with. A short series is first carried out in which the subject is unknown to the sensitive and no object is used, the two not being in the presence of each other, but miles apart. This series is followed by a second one at the same distance, but this time use is made of a psychometric article. Two similar series are also carried out between a sensitive and a subject well known to each other. Comparisons between the results of these series of tests should throw some light on the points raised under this heading. If positive results are obtained when subject and sensitive are well acquainted with each other and no object is used, this may also explain why it is possible for friends and relatives now and then to have a telepathic experience between them when the one receiving the impression does not have an object belonging to the other.

3. *Psychometry of objects that belonged to deceased persons.* Believing as I do that there is survival of human personality after bodily death and, if this is actually a fact, that what survives partakes of a mental factor that is telepathically operative in psy-

chometry, I feel that we may get important information from experiments in which psychometric objects which belonged to deceased persons are used in conjunction with "control" objects belonging to living persons. I found some of the tests which I carried out in this direction highly thought-provoking; hence this additional suggestion for incorporation in the program. For each such test, the experimenter shall obtain from a third party two objects in separate sealed envelopes, one belonging to a deceased and the other to a living person. The two records of the impressions given by the sensitives in connection with the two envelopes shall be handed to the third person who shall try to assess which is which. Special notes should be made of any impression indicative of the deceased person's having passed on. In order to avoid guessing, which would vitiate the results, it is imperative that the sensitive shall not be informed of the nature of the experiment.

4. *Final remarks.* The above suggestions are by no means exhaustive of the problems involved and the possible lines of investigation in psychometry. I thought it best, however, to limit recommendations to those ideas which I consider, in view of my practical experience and findings, to be of primary importance and most likely to result in positive contributions.

I have no suggestions to make as regards tests aimed at ascertaining the actual function played by the psychometric object; and for fear of biasing other possible investigators, I am refraining from advancing any comments as to why, in my opinion, this problem cannot yet be tackled.

Whether or not universities and psychical research societies can guide their students and members in carrying out a well-defined plan, evolved from the various contributions to this symposium, let us hope that at least a few earnest experimenters, and more particularly students of parapsychology, will be impressed by some of the proposals and will contribute their share to the collection of positive data we are so much in need of. We require these data, not only for a better understanding of the phenomena we are dealing with, but also for their correlation, as there seems to be very little doubt that all of them—telepathy, clairvoyance, etc.—are governed by the same modus operandi.

A TEN-YEAR PROGRAM FOR PARAPSYCHOLOGY

By Betty M. Humphrey

Dr. Humphrey is Research Associate in the Parapsychology Laboratory of Duke University and an editor of the Journal of Parapsychology. She has published, individually or in collaboration, thirty articles and one book in the field.—Ed.

A program for future research in any field must be a living, growing, flexible plan designed to keep before investigators the main goals and most important lines of attack on the problems of the field, not a rigid, unalterable schedule of experiments dulling the minds of the experimenters to the possibilities of new developments and insights along the way. Since each new experiment must be erected on the foundation of previous experiments, we cannot know exactly how to plan the experiment for the day after tomorrow until tomorrow's experiment is finished. And so, in parapsychology, we must keep re-examining our plans through the years and keep alert to the possibility that some new development may enable us to by-pass a large section of the experiments which we now plan.

Parapsychology will benefit greatly, I think, during the next decade by a concentrated study of the personality characteristics associated with psi capacities. Although there are a number of other types of experiments that it is important to carry out during the next few years, I should like to devote most of the space allotted here to outlining some of the ways in which I believe personality studies can provide valuable information for parapsychology.

Our two most important long-term goals, I think, are the discovery of the nature of the psi process and the solution of the survival problem. We can hardly expect that these objectives will be completely attained during the next ten-year period, but we should be able to reach many subgoals along the way.

The study of personality characteristics has already aided us in the first of these objectives, in understanding more about the nature of the psi capacities. This line of attack has barely begun, and yet it has been very rewarding. We will undoubtedly understand psi better if we know the distinguishing characteristics of those who manifest the most of it.

Thus far only ESP has been studied extensively in relation to personality characteristics. The results of the one research (unpublished as yet) which deals with the problem of the relationship of PK ability and personality correlates are very encouraging, and they point to a line of investigation that should be expanded during the next few years.

On the ESP side of psi capacity, personality characteristics have been studied in relation to performance in tests of clairvoyance and general extrasensory perception. It has been found that scoring rate in tests of these capacities is in some degree related to the interest patterns of the subjects, to their attitudes toward the research, to intelligence test ratings, and to certain personality characteristics as revealed in the Rorschach Ink-Blot Test and in free-hand drawings. In the next ten-year period we will want to study ESP in relation to many other facets of personality; and especially we need to study performance in other types of tests, such as precognition and pure telepathy, in relation to those personality characteristics found to be related to success in clairvoyance and GESP. There have already appeared in the literature suggestions that subjects who do well in one type of ESP test do poorly in other types. These suggestions do not fit in with our customary way of regarding the relationship of the various types of ESP; and this very discrepancy points to an opportunity to broaden our knowledge of psi. An intensive study of the personality patterns of high-scoring subjects in the various kinds of ESP tests may reveal a great deal, not only about how ESP fits into the personality, but also about how the various phases of the ESP process are related to one another.

The personality studies made thus far have involved both transient and more enduring states of personality. It is a familiar fact that even the best of subjects have their up's and down's in scoring from one session to the next or even within a single session. Is there anything measurably different about the subject when he is scoring high that can be used as a basis for prediction of scoring rate? The use of the expansion-compression criterion for rating free drawings is a step in this direction, since the criterion does seem to be a measure of the subject's mood-of-the-moment, at least for the subjects in the middle range of the expansion-compression continuum. The usefulness of this criterion needs to be more fully ex-

plored, for it has already raised many perplexing problems, the answers to which should certainly increase our knowledge of the psi process.

Other methods of studying the transient states associated with psi performance are needed. This does not mean, however, that we should neglect the study of the relationship of psi to more permanent personality characteristics. Although we have found that a given subject will show marked variation in performance from one day to the next, we also have evidence that some subjects will consistently obtain a higher score level than others. By administering batteries of standardized personality tests to our subjects and by studying, not only gross scores, but also answers to individual parts or questions, we may find items which distinguish high-scoring subjects from low-scoring ones in all types of psi tests.

Perhaps we can collect such material, pick out the best from each personality test, whether it be from the Rorschach or from a simple questionnaire, and incorporate such items in a single personality test which will enable us to select, with a fair degree of success, the best subjects for ESP and PK tests. This program should not only give us many insights into the nature of ESP and PK, but it should also provide us with some glimpses into the relationship between ESP and PK themselves.

An investigation is also needed to determine whether or not the various *position effects* found in ESP and PK test data are related to personality patterns of the subjects. Thus far, in unpublished results of group experiments there are suggestions that such a relationship may exist—at least in ESP tests.

For example, the researches mentioned suggest that one type of position effect found in ESP tests may be an artifact resulting from the pooling of position effects from subjects having two (or more) personality patterns. It is of course too early to know whether this finding will be confirmed or invalidated, but the results are promising enough now to warrant our giving this type of research a place in our ten-year program.

Perhaps displacement, too, is a function of the individual personality. In ESP drawings experiments of the clairvoyance type, striking evidence of displacement was found in the results of the "compressive" subjects, while the "expansive" subjects showed none

of it. Something similar may be occurring in ESP card runs, and it may be detected if we discover some personality measures which distinguish the displacers from the non-displacers.

So far I have mentioned only personality studies of the *subjects* in psi tests; but I hope that before 1958 we can at least start on a comparative personality study of good and poor *agents* in tests allowing for telepathy. At the same time, we must try to determine the role of the agent in these tests. Does the agent himself actually exert a measurable influence, or do the results of GESP and clairvoyance tests differ only because of the fact that the subject *thinks* there is an agent present in the GESP tests?

Some published researches indicate that different results are obtained when there is an agent than are found when there is no agent present. The best example of this finding is the Soal and Goldney work with subject B.S., who scored poorly when no agent was present even when he *thought* there was an agent. Researches along these lines are complicated by the fact that a subject with ESP ability will at least know a better-than-chance number of times whether or not an agent is actually participating. In view of this complication, I should like to see tried a rather difficult experiment involving "high" and "low" aim on the part of the agent—that is, I should like to have the agent in a GESP test "will" the subject to obtain high scores on some runs and low scores on others. The physical situation would be the same for both types of tests and the subject would know only that the test is one of GESP. The only difference between runs for high and low aim would exist in the mind of the agent, who, by his mental attitude alone, would try to make the subject succeed on some trials and fail on others. It will undoubtedly be difficult for the agent to maintain these two different attitudes consistently; one or two failures at this type of test would not provide an adequate basis upon which to conclude that the agent's influence in GESP tests is negligible. By the addition of a complicated coding method of designating high- and- low-aim runs, this experiment could also provide another method for testing pure telepathy, since the only difference between the two types of runs would be in the nature of the agent's *thoughts*.

Another interesting series of investigations that I should like to see undertaken would involve studies of the effect of multiple

senders in ESP tests and of multiple subjects in PK tests. Many new possibilities for application may open up if, for example, we were to find that two or more subjects in PK tests are able to increase the degree of success over that obtained by either subject working alone. There is the possibility, however, that two or more subjects, each trying to influence the dice in his own way—and that way an unconscious one—might actually hinder each other: since their energy is exerted unconsciously, the efforts of one subject might tend to counteract those of another subject. Nevertheless, by exploring widely, we may find that subjects with certain combinations of personality characteristics are able to work together very effectively in influencing the dice. For example, it might be that persons with quite similar personality patterns would be able to form a highly successful team in PK tests. In ESP researches, also, it may be possible to discover certain combinations of personality traits in subjects and agents which will result in a higher degree of success than if randomly selected persons are used as subject and agent.

In addition to studies of receivers and senders, I should like to see personality investigations expanded to include studies of *experimenters.* One of the facts that plague parapsychologists is that some investigators are seldom able to obtain significant results from their subjects while others succeed consistently. Is this difference explainable in terms of personality differences? It seems reasonable to suppose that it is. If we can discover reliable correlates of "successful experimentation," we should be able to place personnel more effectively for the advancement of the science.

Now, to return to the second of the long-term goals mentioned earlier, the solution of the survival problem. The next ten-year period should certainly see the development of a reliable *and easy* method of evaluating mediumistic material. Without such a method research on the problem can hardly progress far beyond the state reached today.

Moreover, within the past few years, it has become more and more evident that there is a very real dearth of mediums who will take part in scientific studies. Because of this situation, it is important to find out if parapsychologists can deliberately develop their own mediums. Selecting subjects for such a project might not

be difficult if we knew something about the characteristics of "good" mediums; we might have only to find persons with similar personalities and try to develop these persons into mediums by techniques of suggestion and hypnosis. We do not at present have a population of mediums, however, to provide the background material for this study. Therefore, it might be worth while at least to make a beginning by using some of our more successful ESP subjects. Or, it may be that the characteristics most needed in a subject for this experiment are perseverance, a high degree of motivation, and, perhaps, suggestibility (which may be the capacity to dissociate easily). It is easy to develop automatic writing in many subjects by the use of hypnosis. Perhaps by using special subjects in similar experiments, we can produce many of the familiar phenomena of mediumship. The possibility of success in such a project will seem rather faint no doubt to present-day parapsychologists; but I think a rereading of such literature as Mrs. Verrall's description of her own development of automatic writing may encourage us to make a more concerted effort to develop mediumship deliberately. And, as in Mrs. Verrall's case, we must not be surprised to encounter repeated failures first.

RESEARCH AIMS FOR THE DECADE AHEAD

By J. B. Rhine

Dr. Rhine is Director of the Parapsychology Laboratory and Professor of Psychology at Duke University. He is one of the editors of the Journal of Parapsychology and has published several books and a large number of articles dealing, for the most part, with experimental parapsychology.—Ed.

Problems of Support and Personnel. The greatest need of the research program in parapsychology today is for more active support. Our problems are too important for us to wait for the naturally conservative professional groups to come to our aid. It begins to look, however, as if we can rely on the intelligent lay public to foster a more adequate program of investigation. Our educational responsibility to this public is, therefore, essentially tied in with the research program itself. At the same time it is necessary to make

clear to everyone the magnitude and extreme difficulty of our problems lest too much be expected of us under the great limitations with which we must cope.

It will be well to fix in mind at the start who is going to do the research for which we are planning a program. Who are the parapsychologists? They are, we find, quite a varied group of people, few in number though they be. There are (a) those who design experiments and develop the techniques or the apparatus to use in conducting them and evaluating the results; (b) those who can effectively do personal testing and other exploratory work depending upon subtle relations between subject and experimenter; (c) those who are qualified by scientific perspective to collect and study spontaneous case material and develop new hypotheses for experimental verification; (d) those who are in their professional capacities (for example, psychiatry) advantageously located to encounter, record, and interpret phenomena of parapsychological interest; and (e) those self-testing amateurs who are capably conducting exploratory tests on themselves.

These and other specializations are developing as parapsychology advances toward a clarified professional status. The same person may, of course, be capable of playing more than one of these roles; that is an individual matter. On the other hand he may be unsuited to any of them. In some instances progress in parapsychology has been impeded by the failure of a research worker to recognize that he was miscast for the particular role he was playing. Interest alone is not enough; neither is scholarly attainment in another field. In the research of the future more attention could well be invested in these delicate problems of personnel.

Emphasis on Exploration. In the research proper I think there is now an urgent need of a more expanded and a bolder exploratory approach. The last decade was one in which methods of verification rather than exploratory activities were particularly stressed; experimental standards, mathematical techniques, and precautionary habits are by this time at a very high level in the better researches. This accentuation of safeguards was, as everyone knows, absolutely necessary. Now, however, without appreciably relaxing these standards, we can well afford to shift more of the research emphasis

to the exploratory front. We can make good use of the freedom we have earned if we keep in mind the tentative nature of anything encountered through observation unverified by crucial test.

One of the exploratory tasks already under way is the making of a wide-ranging collection of spontaneous psychic experiences. The objective is to group these cases roughly in certain main categories associated with our major current problems. Then the special student can analyze the material grouped around a given question and may be able to extract from it valuable hypotheses for further experimental examination.

We may also profitably give more heed to suggestions from related fields. The psychiatrist is in a particularly good position to draw upon the spontaneous psi experiences of the individual and to obtain related personality material of importance in the understanding of them. Other consultants, too, have somewhat similar advantages. The cultural anthropologist, for example, can enrich the collection of case material for parapsychological study. Religious practices and occurrences, both in preliterate societies and in our own culture, may furnish suggestive ideas very promising for further research. The claims of cures and other effects reported from shrines and temples in many lands ought to be examined carefully for all possible effects of interest to parapsychology.

There are many provocative claims of magical powers still active in our own country that appear to warrant closer inspection by parapsychologists. Among these are the nonmedical removal of warts from human beings and even from animals, the prevention of blistering in case of burns, the stopping of bleeding, and the like. The location of subterranean water and other minerals by psychic means (dowsing) is another of these rustic magical arts—one that is already on the agenda of projected experimental research. The first question is whether there is anything occurring in these cases that cannot be accounted for by recognized principles of biology and physics.

Absurd and improbable though they appear, even to many students of parapsychology, we cannot afford to neglect the claims of hauntings and poltergeists. Likewise we need to keep an eye on the various occult and spiritualist groups so numerous here in the

United States, because they may conceivably turn up something which will stand examination and verification under controlled conditions. Since the consequences of positive results are as great as they are, we can very well afford to investigate these matters on the basis of exceedingly slender probabilities of success.

Conscious Control of Psi Abilities. Exploration will not, of course, be confined to these nonexperimental activities. There are already many experimental projects on which a broadly exploratory type of approach is needed, and more will spring up as we go. Perhaps the most central problem in the minds of active investigators of psi phenomena is the question of how these unconscious psi powers can be brought under conscious control. Once we solve this problem the rest will be made enormously easier. The study of spontaneous cases for good clues to conscious control is only one of the approaches. We need to follow up with a study of the personalities of subjects who have experienced conscious awareness in spontaneous ESP, and such a study may quickly become experimental.

There is a need also for many individual self-testing researches with careful introspective analysis of effects associated with success. A large-scale comparison of specific mental conditions affecting success will have to be made with records of both conscious and unconscious effects on the part of the subject. These conditions will involve experiments with drugs, with various kinds of trance states, including the hypnotic, and perhaps also the trial of certain primitive and occult practices. Likewise a full and varied test of the available techniques involving unconscious response (such as automatic writing) should be conducted.

Psi and Physics. How do psi factors interact with the physical world? This question is basic, even to the understanding of the commonest thought-brain reaction. The experiments already conducted on ESP and PK with respect to space, time, and mass will be carried much further no doubt. Is it possible that time makes absolutely no difference in ESP? Does mass mean nothing at all in PK? Or if any measurable relations at all exist, where do they come in? The PK researches seem to offer a particularly tangible sort of attack on the old, and still basic, mind-body problem—

probably man's most urgent scientific issue of today.

Is there a quantitative energetics of psi phenomena that we can get hold of experimentally? In order to begin to find out we need to vary our PK experiments over a wide range of test procedures, trying PK on systems quite different from falling dice and discs. There is need to try other bodies in motion, chemical reactions, and even biological processes. But even if we should be limited to dice-throwing tests we will want to vary the conditions so that the nature of the effect on the die is brought into the clear, revealing whether it be a mechanical application, a special weighting of one side of the die, or an effect of which we have as yet no conception.

Precognition Problems. The most revolutionary of all the psi phenomena—and therefore the most revealing of the true nature of the mind—is precognition; yet it is little more than established itself, and is the most isolated and unexplainable occurrence on the record books of science. Is precognition a form of ESP, so that we may have both precognitive telepathy and precognitive clairvoyance, or is it a general mental property so that one may also actually go ahead and experience in the present what one is himself going to go through later as a result of sensory perception? This would be like a reversal of memory and might be called "pure precognition." Does it really occur, as often appears to be the case in certain spontaneous psychic experiences?

It will be interesting to experiment on the baffling question whether we can have both precognition and volitional freedom, whether one can foresee what he is going to do and then avoid doing it. We need, in fact, to find out, if we can, how the operation of precognition can be rationally comprehended.

Continuity of Personality and Post-Mortem Survival. Is there a continuous interrelation between "individual" minds with separation perhaps only on the level of consciousness? Here again we may profitably begin with an analysis of the spontaneous material and later channel our efforts into a more controlled mode of study. We must also try to find out whether telepathy occurs as a direct mind-to-mind transfer of thought or whether it is a transmission by way of the brain of the sender or the receiver or both. In other words, we still do not know if telepathy (in this original meaning

of the term) actually occurs. ESP of another brain state may not be telepathy; it would appear to be clairvoyance. Can we in this decade ahead close in with more refined research methods on this very important and basic issue: Does mind ever *directly* contact mind?

The next great question is an outgrowth of the preceding one—whether the mind can operate in its own right, independent of bodily function. Progress on this question will therefore be greatly helped by what is learned about those already listed; but there are some researches that can be carried out in a somewhat more direct attack on the problem. As in nearly all of our problems, there is need for a thorough round-up of all suggestions available from the spontaneous cases which suggest separability of mind and brain and which might suggest the existence of extrasomatic personalities in nature. But again this preliminary study is only to point the attack.

One limitation in the study of the question of post-mortem existence has been the want of a simple test for the reliable evaluation of the free verbal material customarily obtained from mediums. The need of this essential tool has long been appreciated and some very important progress has already been made toward providing it.

While the general run of mediums from several existing cultures and faiths might profitably be studied, at least in an exploratory fashion, there should also be serious attention given to the development of controlled mediumship in individuals, in the hypnotic or a related trance state. However, the whole complex problem of incorporeal agencies presented by our religious heritage calls for the most mature group planning and, as far as possible, for some general agreement in advance as to standards of evidence and logic of interpretation.

In General. With all our ambitious aspirations for the next decade of parapsychology, we must of course be thoroughly realistic and practical too. Grand research ventures almost certainly lie ahead of us, but only if we maintain sound progress step by step in our undertakings. By aiming too high, desiring too much in a short time, or venturing too far, we may conceivably bring our inquiry into unnecessary difficulties and discouragements. We may all recognize the importance of developing all the natural interrela-

tions that bind parapsychology to its neighboring fields of research, all the general laws that reduce the isolation and strangeness from which our branch of study has suffered in the past.

One very "practical" task that now looks promising is that of developing a personality test for use in selecting capable subjects for psi experiments, a test with reliable predictive value. The beginning studies made on the personality correlates of psi ability have already gone far to prepare the ground for this step. Along with these personality studies the extensive analyses of the extraordinarily lawful position effects have quietly but unmistakably in the last few years moved psi phenomena right alongside the appropriate areas of orthodox psychology. The interlocking generalizations that are developing across the imaginary boundary would doubtless soon cost us our distinctive prefix "para" were these particular studies all our field encompassed. Certainly every step toward integrating psi with the total schema of personality represents a direct advance on our goals.

Finally, we do not want our attention, either to the more immediate needs or to the more remote problems of the research, to limit our appreciation of the large implications of our findings for human society today and for all time. If the research is to be understood, perhaps if it is even long to continue, we may have to regard this task of interpretation, too, as an integral part of the program of work.

RESEARCH PROJECTS IN PARAPSYCHOLOGY

By Gertrude R. Schmeidler

Dr. Schmeidler is Instructor in Psychology and Research Associate in Parapsychology at the College of the City of New York. She has published seven articles on parapsychology, two of which were in collaboration.—Ed.

For a research worker who can check on a single hypothesis only by accumulating the data of session after session—and sometimes experiment after experiment—writing an article about research that needs to be done has the same fascination as sending a letter to Santa Claus; and there is the same temptation to keep adding pos-

sibilities until the total is staggeringly impossible. My own thinking along these glamorous lines is confined by the narrowness of my experience in parapsychology, which has been limited almost entirely to experiments on personality variables in the college population. I shall therefore take this topic as a starting-point.

Psychological Variables

Personality Traits

My experiments indicate that in classroom tests of the clairvoyance type, certain personality and attitude patterns can be used to predict that one group of subjects will make better ESP scores than another group. From this simple fact, the number of questions that rises is legion. Will the effect hold up on still another retest? Does the relationship apply only to experiments of the clairvoyance type, and will other variables be the predictive ones for precognition? For PK? For spontaneous experiences? For telepathy? Are these factors significant only for my New York classes? If so, what variables are predictive for other groups? For experiments conducted by others? Can we state the optimum relationship between subject and experimenter in general terms? With different motivation, would a different pattern of personality factors be the significant one? Would there be a different pattern if we used repeated sessions? Or a real-life setting, such as a party? Or still other situations? What psychological tests give the best description of the significant factors? Would analysis of the exceptional cases uncover still other laws at work? And so on.

The critical reader will realize that there are two reasons for suggesting all these experiments. One is practical: as we learn what conditions affect group ESP scores, we have better prediction and control of the results. The second is theoretical: we want to know if the predictive personality traits are fundamentally related to paranormal ability, or if they reflect only some second-order relationship. If the latter, we must of course look further for those basic variables to which personality traits offer only a clue.

Mood and Attitude

Personality traits are relatively stable. Insofar as they are important, the person who makes a good score in one experiment

should do well for some time—presumably until the situation takes on a different meaning for him, or until he himself has changed.

This pattern is reported often enough to justify a study of traits; but we find also that transient moods seem to be associated with changes in score. There is one mood that many different workers have considered favorable to ESP: Rhine calls it "spontaneity"; Carington, "an attitude of almost nonchalant receptivity"; and Murphy, "a condition . . . involving both concentration and relaxation." I think I have observed the same state as a kind of eager but carefree attitude, where subjects show a maximum of interest with a minimum of ego-involvement.

If there is a common core in these observations, and if this mood is in fact associated with ESP, an experimenter should be able to devise an objective test for it: perhaps in terms of accompanying muscle tension or autonomic changes, perhaps through imagery or perceptual lability, or a projective test or questionnaire. This would be no minor project, for moods are notoriously difficult to test; but success would bring us one step nearer recognizing (objectively not introspectively) when psi will operate. Once the mood is identified we might also gain important insights by studying the psychological conditions under which it appears; whether it is associated with creativity, for example, or with dissociation, or negatively associated with skepticism.

Self-Consistency

Experimenters agree that some moods are favorable to psi, but they also agree that subjects vary: that one will respond to encouragement and another to challenge; that money rewards will stimulate some but embarrass others; and that these idiosyncrasies are reflected in their ESP scores. Just as authors have said that the life of any man could produce one great novel, so I suggest as a working hypothesis that any individual will show his own characteristic patterning of psi successes and failures.

Checking this hypothesis might begin with the Thematic Apperception Test, in which a subject is required to tell twenty stories, using twenty standard pictures as his points of departure. In unpublished exploratory work I have asked students to make ESP guesses while telling these stories; and the results implied that each

subject was showing a highly personal pattern of ESP failure or success, which accompanied the tension or release, the guilt, aggression, or contentment that he was expressing. If such a pattern is found for a subject he would, as it were, be calibrated for ESP; and we might predict when he would have a spontaneous experience, or, if a certain mood was established under hypnosis, whether that mood would be favorable for psi.

Physiological Variables

It is tantalizing to speculate that we might be able to identify the conditions for psi more directly than by psychological tests and analyses. Strain, tension, conscientious effort, and critical disapproval have all been considered bad conditions for paranormal phenomena; and this list is provocatively similar to a description of the pre-operative depressed patient compared to the same man after prefrontal lobotomy. Perhaps the frontal lobes or others of the higher cerebral centers have the inhibition of psi as one of their many inhibitory functions. And perhaps, in the constant flux of electrical tension in the cerebrum, with shifting patterns of activity in the thalamic and cortical centers, lies the complex of interrelations that makes psi show itself at one moment but not at the next, and with one person more than with another.

Two lines of research suggest themselves. One involves finding subjects with injury to known brain areas. If such patients cooperate in a series of psi tests, we would hope to find either: (1) a high level of scoring, or (2) no evidence of paranormal ability by any test whatever, whether it be gross score, salience, displacement, patterning in terms of mood, or any other that the ingenuity of research workers can devise. If all cooperative patients with a given locus of brain injury give chance results, it implies that the injured part of the brain is essential to psi; and conversely, a high scoring level implies that the injured part normally inhibits psi.

Another attack on the same problem can be made through the electroencephalogram. If our psi subject is hooked up with various bipolar leads, to show thalamocortical as well as intercortical potential differences, and if the time he makes his psi responses is recorded on the EEG record, we can look for EEG patterns that

identify successful psi responses. This research would be an elaborate as well as an expensive project, but would have one by-product which might recommend it to a graduate student working for the doctorate, or to a mature research worker. If the psi problem were phrased in terms of a mood study, the EEG records could be analyzed in terms of mood change and work output, making a contribution to our knowledge in this area. If they should also single out the flashes of psi, they could open up a royal road for parapsychological inquiry!

Physical Variables

Although it is so important to know whether psi is independent of space and time, our evidence is not conclusive. If, for example, psi is really proportional to distance or time raised to some *fractional* power, where the value of the fraction is small, very wide experimental variations will be necessary to detect any effect. We might have to contrast a target that is a fraction of an inch from the subject with one that is thousands of miles away; or have knowledge of results coming within a second contrasted with an interval of years. It is also essential that the subject be ignorant of whether his target is close or remote, in order to control the differences in motivation that we know can affect the results.

With PK, too, studies of mass should be undertaken, with the subject kept ignorant of the experimental variations and with a wider stimulus range. Can Brownian movements be influenced more readily than dice or discs? Or, going below the molecular level, could the frequencies with which cosmic rays hit a Geiger counter, or the paths of electrons in a Wilson cloud chamber, be modified more readily than the Brownian movements? If no change in PK with mass can be detected with microcosmic phenomena, the logical consequence is that experiments should be directed to still larger masses; and we must find whether faith *can* move mountains or control the tides or falsify the predictions of astronomers. In such research, it will be of interest to work out the energy requirements of the successful tasks, as opposed to those where, as with static objects, PK seems to fail.

The Function of the Agent or the Experimenter

When we agree that the attitude of the subject is important to psi, our corollary is that the experimenter is important too

since he represents one determinant of the subject's attitude. But the question must also be raised whether he himself exerts a paranormal influence. A similar problem occurs in many spontaneous cases, or in experiments which include an agent.

It is interesting to plan a series of experiments that could trace such effects from the immediate, purposeful influence of an agent or an experimenter to the less clearly defined area where an agent might exert some force without conscious knowledge or volition. We might begin by checking the relative contributions of experimenter and subject in a PK experiment, through some such device as having one use a record sheet with twice as many spaces in the column as the other's. If the QD follows either sheet exclusively, it implies that that person is exercising the PK. If it fits parts of both sheets the subject and experimenter may be reinforcing each other, just as tides are higher when sun and moon pull together.

Other experiments in this series might have the experimenter or an additional observer hoping for a high score but ignorant of what the subject was trying to call, while making records as before; or have an observer try alternately to help and to hinder while completely screened off from the experiment; and if all these show the observer to have been effective, the final test would involve his trying to influence the results of some future experiment, to be performed at an unknown time. Such precognitive PK, with its analogy to casting a spell or to poltergeist activity, would have most interesting implications. If, on the other hand, positive results were obtained in the first of these experiments but not the latter ones, and if the evidence implied that morale and personality factors were equally favorable in all cases, we might have found the limits within which PK operates, in terms of space, time, or conscious direction.

Another series of experiments might explore paranormal influence over other individuals rather than over the movement of inanimate objects. There have been many scattered reports which indicate that sensory images, vivid enough to be confused with sensory experiences, can be aroused by psi, and perhaps even that psi can stimulate the sense receptors themselves. But if sensation can be caused by psi, then what of responses? In an experiment to

investigate paranormal influence over voluntary activity, one might have the subject reading, unaware of the nature of the research, while the agent in another room tried to make him move a leg or an arm, or smile, or shake his head. (The time and order of these directions would, of course, be determined at random.) Another experiment could be designed to investigate similar influences over such involuntary activity as metabolic rate, blood pressure, or perspiration. Positive results would imply that the limits of paranormal healing might extend as far as the boundaries of psychosomatic medicine. In the logical culmination of such a program the agent would try to influence body processes which are not directly affected by either the voluntary or the autonomic nervous systems; but this falls outside the scope of investigations that could be planned for the near future.

Research with Extraordinary Subjects

Although lack of experience renders my opinion inexpert, this topic seems too important to omit. Let me suggest that any experiments could probably be completed with greater clarity and efficiency with gifted individuals than with subjects chosen at random. It may even be that sensitive subjects could disclose energy relations or physiological correlates of psi that otherwise would be imperceptible because our instruments were not sufficiently delicate or our research accurately enough aimed to detect such faint effects without them.

A PROGRAM OF PARAPSYCHOLOGY

By Robert H. Thouless

Dr. Thouless, who was for two years (1942-44) President of the Society for Psychical Research, is Reader in Educational Psychology, University of Cambridge, a Fellow of Corpus Christi College, Cambridge, and a Fellow of the British Psychological Society. His writings in the field of parapsychology comprise eight articles (two in collaboration) including experimental work, critical reviews, and important theoretical contributions.—Ed.

I do not think that we can with any confidence lay down a program for parapsychology for the next ten years. We can specify

what seem to us the next problems to be attacked; the ones after next must remain relatively indefinite. A research plan grows as one works; every successful piece of research suggests new problems which are the problems of the next research. Yet our guesses for the future may be worth while. They should at least help to keep parapsychological research out of ruts.

I think it can be assumed that we agree now that we have passed beyond the time when there was any value in repeated experimentation under the same conditions till one has accumulated odds of 10^x against chance. One still occasionally hears the suggestion that this is of value to "convince the skeptical scientist." I do not believe that the skeptical scientist unconvinced by the experimentation of this type already done will be convinced by more of it; nor do I think it is worth while to waste our time on unprofitable lines of research in order to convince him. This kind of experimentation had its place in the past, but what can be accomplished by it has been done and going on with it would be a waste of time.

Rather, our job now is to use quantitative experimentation as it is used in other sciences as a sensitive instrument for detecting causal connections. Rigid exclusion of other possibilities of explanation remains, of course, important, but exclusive concentration on this necessity has led to a relative neglect of two other necessities to which it is to be hoped that parapsychologists will pay increasing attention in the future. These are: fruitfulness of experimental methods and improvement in the design of experiments.

The devising of more fruitful methods of experimenting is one of the obvious immediate necessities. It was a great contribution to methods of research when the parapsychologists of Duke University started experimenting with a fairly high proportion of the total population instead of relying on a few highly gifted subjects. But this is still a somewhat timewasting process for several reasons: (1) because of the general low rate of scoring; (2) because of negative or low rates of scoring in nonsalient parts of the experiment; and (3) because of the tendency of subjects' scores to decline with continued experimentation. The causes of decline deserve a special study; if they can be discovered we should not only have advanced in understanding psi phenomena but we should also have

overcome a practical difficulty. Attempts have already been made to reduce the second difficulty by suitable arrangement of test periods. Above all, however, it is the first factor—the general low rates of scoring—toward which the efforts of experimenters should be directed. We do not want to fall back on a few "psychics" as subjects, but rather to devise methods of getting all subjects to score at high rates. This may be attainable by volitional control of the psi processes or by volitional control of the inhibiting factors. Methods of achieving such control are not likely to be worked out until experimenters in psychical research train themselves to give positive results and are not merely content with getting them from their subjects. Failing volitional control of the necessary attitude, the most hopeful line seems to be the use of drugs. It is not likely to be by random trying of this and that drug that success will be achieved, but rather by deciding what particular normal functions should be put out of action or enhanced and then finding a drug or combination of drugs that will have the desired effect.

Another general line of research directed towards greater fruitfulness of experimentation is the investigation of the social psychological factors necessary for psi success. It is clear that some centers of psychical research achieve a general higher level of positive results than others, and the conditions of such success should be stateable in terms of the social psychological situation. So far there has been no research in which the situation has been experimentally varied in order to find out what directions of variation increase or decrease the rate of psi success. Most researchers have experienced the fact that introduction of an atmosphere of suspicion tends to reduce or inhibit psi success, but I know of no systematic investigation in which the suspicious attitude has been introduced deliberately in order to determine its effects on scoring rates. It has been made a reproach against parapsychology that its results are sensitive to the social atmosphere of the experimental environment, but this may well be true of all psychological experimentation. I doubt whether an experiment in normal psychology (such as the determination of a sensory threshold) would give reliable results if carried out in the paranoid atmosphere which a certain tradition of parapsychological research has regarded as the standard accompani-

ment of adequate controls. The standardization of favorable social conditions for positive results is a fruit to be hoped for from such a research. Its basis must obviously be adequacy of control without fuss, but a more complete specification of the conditions can only be made when the research is completed.

Improvement of experimental design is another general aim which should be in the mind of parapsychological researchers during the next ten years. In the past, attention has been too much concentrated on validity of conclusions to the neglect of the important aspect of economy and fruitfulness of design. That is, the design of an experiment should be such that it gives the maximum amount of information from the minimum amount of experimental data. Principles of design are illuminatingly discussed by Professor R. A. Fisher in his book, *The Design of Experiment*. The principles developed in such works are still too little understood in psychical research. The research worker seems often to start his work with no clearer idea than that of accumulating a large quantity of data in some field and trusting to luck that appropriate methods of drawing conclusions will suggest themselves afterwards, with the result that the answers to questions that arise are indecisive and more is suggested than is proved. In early exploratory experiments such defects of design were unavoidable since there was not certain knowledge of what aspects of the results would prove illuminating, but as work advances and problems can be more definitely formulated it becomes more necessary that attention should be given to designing an experiment which will answer accurately and economically the specific questions on which the experimenter hopes to get information.

These are general problems for parapsychological research. One may also try to suggest specific problems for immediate attack. It seemed to me that Professor Rhine's recent articles on telepathy, clairvoyance, etc., suggested a comprehensive scheme of research into the sufficient and necessary conditions of ESP, and in my note on these articles I suggested investigation of all possible combinations of such conditions—the presence or absence of knowledge of the target event in some other person's mind, the present or future existence of the event, etc. Some of these combinations of condi-

tions have already been studied, but not all. This, however, is routine experimentation clearing up loose ends in existing research.

Of more novel problems I would suggest the following: first, in precognition it is generally assumed that one foretells an event that is going to happen and that if it does not happen the precognition is a failure. There is, however, another possibility suggested by some spontaneous evidence: that one precognizes a conditional future, a probable event which may not take place because its actual occurrence was prevented (possibly as a result of the precognition). I do not myself see how one could devise an experimental situation to distinguish between such an absolute and conditional foretelling of the future, but it should not prove an insoluble problem to the determined experimenter. Dreams also are worth investigating for precognitive phenomena, but taking into account that dreams use symbolic methods of expression (as was known to Artimedorus many centuries ago and recently rediscovered by Freud). That the precognitive element of a dream may lie in its latent and not its manifest content makes a greatly increased difficulty in the quantitative assessment of the possibility of chance coincidence, but this difficulty is not, I think, insuperable.

Secondly, I suggest investigation of the conditions of singularization. Positive results in ESP or PK experiments require that the subject should have reacted to (or acted on) one particular object or set of objects and not others of the same kind. The problem of how it happens that the experimental object is thus picked out seems to have attracted little attention except for the restricted case of what is called "psychometry."

Thirdly, we know too little about the role of the experimenter. It always seems to be assumed that the subject is the important element in the experimental situation. This is not certain even in ESP experiments, and there does not seem to be the slightest reason for attributing results to the subject rather than to the experimenter in PK experiments. I have recently suggested in the *Journal of the S.P.R.* an experimental design for investigating the relative contribution of experimenters and subjects to the variance in ESP results. The experiment led to no conclusions because the group to which it was applied showed no sign of positive scoring but I hope

it may be repeated by someone with a suitable group of positively scoring subjects.

Fourthly, there is a problem I have recently discussed in correspondence with Professor Rhine. I am not satisfied that experiments for demonstrating PK completely exclude the possibility that results might be due to some cognitive psi process so long as there is any freedom for either the subject or the experimenter to choose the target face, or to control the initial position of the dice in the mechanical throwing device, or to control the speed or time of stopping of the throwing apparatus, since in all such cases it is a possibility that subject or experimenter has paranormal knowledge of the fact that a particular way of doing one of these things will result in predominance of a particular face. I think the possibility is remote but not absent, and I have suggested a design of experiment which eliminates all such freedoms. My own attempt to carry it out has led nowhere since neither I myself nor my co-experimenter succeeds in scoring positively even with all the freedoms. I hope it will be repeated at Duke University with a positively scoring PK subject.

This list of specific problems might be indefinitely extended, but I have come to the limits of space which can be accepted from a single contributor. There is one last general point for future experimental research in parapsychology that I should like to make. I hope in the next ten years to see a considerable broadening of the field in experimental research. When PK as well as ESP began to be investigated in Duke University, the field of inquiry was doubled. But it remains small in comparison with the total field of reported parapsychological phenomena. We cannot be content until such alleged phenomena as materializations, automatic writing, auras, psychic healing, and mediumistic phenomena are also brought into the laboratory. That may be a program for the next hundred years rather than for the next ten, but it is an aim to bear in mind even now. There is a danger of parochialism in a laboratory parapsychology which forgets all the facts of parapsychology except those which have already proved amenable to quantitative methods of research. It may be practically necessary to restrict one's field of research by tackling only a few things at a time, but one gets a

false picture by closing one's eyes to the background phenomena which must also be taken into account before the whole thing can be understood.

SUGGESTIONS FOR EXPERIMENTS IN PARAPSYCHOLOGY

By R. Warcollier

Mr. Warcollier, a chemical engineer and inventor by profession, is Vice-President of the Institut Métapsychique International of Paris and editor of its *Revue*. He has produced a half-score of articles and two books devoted to the study of telepathy.—Ed.

Pure Telepathy

Telepathy is due, hypothetically, not to a sending-out of waves or of corpuscles from the agent toward the percipient, or from the percipient toward the agent, but to the formation of a sort of psychic "coupling" between the two. It would be interesting to experiment with a percipient placed in one spot and several agents, scattered at widely different points in space, each attempting to send a different part of the same stimulus. Would the percipient perceive the stimulus as a whole, although none of the agents knew it in its entirety? (The experimenter who planned the experiment should be entirely unknown to the percipient and to the agents.)

This experiment will be most likely to succeed if the percipient knows the agents and believes them to be assembled in one place while sending the message, instead of being separated and at a distance from each other. One could utilize designs in a similar procedure, but the extrasensory perception in this case would be by clairvoyance.

The hypothetical psychic coupling exists naturally between two persons. Can it be extended to three, four, ten, etc., becoming *polypsychic?* Polypsychism is a convenient hypothesis to explain "group spirit," but can this psychic interaction extend itself to all humanity?

Psychic coupling is certain when two people are experimenting; and polypsychism is very probable in a union of several persons (as

with spiritualists), and quite probable in a school (as I study it with my cross-out test). But does it really extend to a crowd, a nation, a race, a species? This has not been proved, but such a discovery would be exceedingly interesting from a social point of view. The fact that parapsychology would thereby assume social significance would appear to me of great importance for its further development.

Pure Clairvoyance

It is only the "radiesthesists" [the French equivalent for "dowsers," "diviners"] who have made systematic experiments on identifying the nature of material, spatial objects. However, they have not made progress on the question. The problem could be resolved by quantitative methods. This could be done by replacing the five card symbols with thin sheets of metal pasted on pieces of cardboard; for example, gold, silver, tin, aluminum, and lead. One could also use the designs of the ordinary ESP symbols drawn by lines made with gold, silver, etc. on different packs of cards and could then see if the gold deck gives positive results more often than the silver, etc.

In a word, does the chemical nature of the stimulus play a role in ESP (by pure clairvoyance) and have the positive or negative results any connection with the atomic number of the simple substances used or with the molecular weights of the compound substances? One should then know how the compounds, the salts of the metals, are perceived in comparison with the metals themselves. Will a drawing made with lead sulphide be perceived as if it had been done with metallic lead? Etc.

It might be interesting to study the manner in which the design is experienced in ESP as compared with normal vision. The design of a circle, for instance, is always made in black on a white ground. What happens if the designs are in white on a black ground, and especially if these designs are made in white on a white ground but with whites of different chemical composition? For example, on a card "loaded" with barium sulphate the white design may be made with zinc sulphide or with antimony oxychloride. To our eyes nothing is visible; for ESP . . . ?

Another interesting situation is presented in the case of an un-

developed photographic plate or writing in invisible ink. Would it be difficult or impossible to perceive these by ESP? One might also use designs made with radioactive substances, luminous or non-luminous.

When one does ESP experiments in pure clairvoyance with the designs in colors, or with colored cards mixed with white cards, one must give the composition of the colors and of the white "loading" of the card. For example, one may wish to study the effect of red. But printing inks are made of reds which are very different as to chemical constitution: vermillion of mercury or of antimony, minium of red lead, carmine of cochineal, various analine dyes. The result obtained by one experimenter cannot be compared with those obtained by another if their materials are not identical. One might suppose, for example, that our ESP would be more effective on mercuric sulphide (HgS), which our organism does not contain, than with an organic pigment containing, like our body, hydrogen, oxygen, and carbon.

The experimenter starts off with the idea that red itself is different from green and blue. But when one works in darkness or when the symbols are in sealed, opaque envelopes, there is no longer any red or green. One is obliged to admit that ESP perceives, not the color, but the set of peripheral electrons of the molecules and it knows that our color sensations correspond to each of these sets. But science is still ignorant as to whether all reds have the same set of surrounding electrons. ESP may be able to help solve some of these problems of physics and chemistry.

Let us note that if ESP can detect variations as tenuous as those involved in the atomic space of the drawings on a card, it could be used to find vibrations in the macrocosm, radio waves (the ultra-short ones) in the vicinity of the agent or the percipient, and at the other extreme, the movement of the stars of the cosmos. It would be useful in any case to know its limits in the infinitely small and the infinitely great.

Psychokinesis

If it can be shown that the ESP faculty is facilitated by certain stimuli—for example, that a design made with uranium is easier to perceive by clairvoyance than the customary black design made

with lampblack (carbon)—then the dice ordinarily used in PK tests can be exchanged for dice with the spots marked with uranium. We can tell whether ESP is a limiting factor in PK tests by noting whether the PK results improve when the more facilitating ESP stimuli are introduced.

In the photographic emulsion of a negative there are a multitude of microscopic cubes of silver bromide (AgBr). If one could slightly fog a sensitive plate one could reduce this silver salt on a single face of each of the cubes. Then, reheating the plate slightly in order to give a certain mobility to the cubes, one could attempt to influence them by PK so as to obtain designs by the arrangement of the faces, some of which have been exposed.

The Problem of Time

As a qualitative experiment I propose to utilize, with subjects gifted in precognition, the "psychometry" of sealed letters specially written for the purpose. For example, the experimenter will write a letter to a friend, dated the first of January, 1949, telling him the effect of general events of 1948 (as he, the experimenter, guesses them in January, 1948) on his family life and his business. He writes of these events as having happened.

Will the subject be inclined to correct by precognition the statements of the writer when he has this letter to "psychometrize"?

Conclusion

The evolution of the physical sciences makes them less and less accessible to the general public; soon physics and chemistry will no longer be understood except by those who are familiar with higher mathematics.

Parapsychology, having left the path of observation and qualitative research, utilizes mathematical methods and is becoming esoteric for most people. The public, not being motivated to take the trouble to understand, will become disinterested; on the other hand, men of science, not *wishing* to understand, will continue to ignore the work of parapsychology. Parapsychology must make a discovery in the realm of science; for example, in psychology (polypsychism) or even in physics or in chemistry (paranormal cognition of a material system) presenting a positive contribution

to the present-day science which the latter cannot make by its own means. If pure telepathy occurs, perhaps polypsychism is a fact. If pure clairvoyance occurs, ESP can make a discovery in the material world. When this happens, our role will be accomplished; science will "discover" parapsychology.

SOME BASIC PROBLEMS FOR PARAPSYCHOLOGICAL RESEARCH

By J. L. Woodruff

Dr. Woodruff was for several years a research assistant in the Parapsychology Laboratory at Duke University. At present he is a member of the Psychology Department of the College of the City of New York. He has published eight experimental articles in parapsychology, seven of them in collaboration.—Ed.

THERE are a number of factors that must be considered in the formulation of a program of research for parapsychology. The primary question is, of course: "What direction (or directions) of future investigation will prove most fruitful over a ten-year period?" However, a meaningful formulation of such a research program is dependent upon proper assessment of many practical problems concerned with personnel, financial support, research facilities, etc. As the situation with regard to these problems is not yet stabilized, a too-detailed plan of research would seem to be somewhat impractical.

Then, too, there always exists the possibility that a dramatic research discovery might well bring a sweeping re-evaluation of present-day methods of investigation and necessitate an almost complete reorientation to the basic problem.

Another important preliminary problem arises. How much unity of effort does the phrase "a ten-year program of research in parapsychology" imply? The fact that present-day research in this field appears to be somewhat chaotic seems to have led the editors of the JOURNAL to institute this symposium. An agreement on certain major goals and a program to eliminate too much duplication of effort are highly desirable. On the other hand, a program that is too narrow and too rigid is not only undesirable, but, because

of the research predilections of the various investigators in the field, impossible. One of the major and most difficult problems, then, is the directing of individual efforts toward a proper goal without stultifying new and provocative approaches.

In general, two different tendencies are noticeable in the research efforts in the field. Some investigators seem to use an extensive approach and are concerned with broadening the field of parapsychology. A survey of the literature for the past fifteen years makes this trend abundantly clear. Another approach is possible. This might be called an intensive approach and implies the systematic investigation of a particular area before a new area of research is opened up. The bias of the individual investigator will determine the approach he employs. The position taken here is that the intensive approach has been too much neglected. There is little evidence that a systematic investigation has been made in any particular segment of this field.

The central problem of parapsychology still remains. It is the creation of a repeatable ESP experiment. Although there are certain consistencies running through some of the data in the field, there is, in a strict sense, no repeatable experiment. It is suggested that research along two lines may yield the answer to this stimulating (and sometimes frustrating) problem. Although valuable preliminary investigation has been made, a systematic attack along these lines appears to be necessary.

The first approach is concerned with determining the nature of the psychological environment of the *successful* subject. It is possible that every human possesses psi ability that will be demonstrated, given the proper situation. Research can be directed toward determining systematically the conditions which are most effective for most subjects. Since it is also probable that a particular set of conditions will not be equally effective for all subjects, an analysis of the conditions necessary for individual subjects can be carried out. A beginning has been made along these lines. Certain problems of motivation, subject-experimenter relationship, novelty of material, etc., have been investigated. In addition, most investigators have clinical impressions which should be put to experimental test. It is suggested that an intensive program of research be formu-

lated in which environmental conditions will be methodically investigated.

The second basic approach to the repeatable experiment is that of measuring the personality structure of the successful subject. Here, too, valuable contributions have been made in recent years. The results obtained by Stuart, Smith, Schmeidler, McMahan, Humphrey, and others are interesting and instructive. A program in which personality structure and its relation to ESP scoring is systematically investigated with a wide range of clinical and diagnostic techniques is suggested. It seems possible that the repeatable experiment lies in this direction. It must be recognized also that the problems of personality structure and of environmental condition cannot be entirely separated. It is probable that a particular type of structure performs most effectively in a particular experimental environment. This problem is one for intensive investigation.

Other investigators are interested in other problems and have suggested other techniques for achieving their ends. The approach suggested here is that which from my own point of view seems to be most valuable.

SPONTANEITY AS A FACTOR IN ESP

By WALLACE B. SCHERER

ABSTRACT: In an experiment designed to study the effect of spontaneity in ESP tests, subjects made trials, one at a time at widely spaced intervals, only when they had a definite impulse or hunch as to the correct response. The results of these "spontaneous" trials were compared with three types of "control" series: those in which the trials were made one at a time at widely spaced intervals but with conscious deliberation on the part of the subject before he made his response; those made with the trials grouped into runs and with conscious deliberation before each trial; and those made in runs with no directions as to method of response. Two self-testing devices were used (the Marble Machine and the Hunch Box) in both of which the subject was required to identify, by ESP, one of five colors.

The combined "spontaneous" data proved to be highly significant. None of the control series, either singly or in combination, yielded extrachance data. The results therefore support the hypothesis that conditions favoring spontaneity are more likely to produce good ESP scoring than conditions like those of the control series in which spontaneity was presumably at a minimum.

Mr. Scherer is Research Assistant in the Parapsychology Laboratory.—Ed.

THERE is wide general agreement among parapsychologists upon the importance of subtle personal factors in tests of extrasensory perception. In a survey of what experimenters had said regarding the conditions affecting the occurrence of ESP, Smith and Gibson (6) found that most of the suggestions fell under the general heading of subjective factors of motivation. However, most of these suggestions are still in the class of hypotheses which have been advanced by investigators on the basis of impressions formed during their experimentation. As Smith and Gibson pointed out, therefore, the importance of these opinions or judgments lies largely in the insights which they provide for further research. There is a need for experiments designed exclusively to determine the role of these motivational factors in psi responses.

The present research was designed as an exploratory effort to isolate and test the importance of one of these suggested factors of motivation in tests of ESP. This is the factor which may, perhaps, best be designated as spontaneity in the subject's response. There is already some evidence in the psi data that spontaneity may be an important factor in ESP. The evidence is provided by the

studies of position effects which show a tendency for hits to be grouped into systematic patterns in relation to the structure of the run, the record sheet, or some other unit of the test situation. A number of investigators, for instance, have reported that their subjects, in making a sequence of trials in rapid succession, have obtained their greatest success on the first trials of the sequence, followed by a decline in scoring in the remainder of the trials.

Such effects tend to be repeated from run to run even within a single session. As Jephson (2) has pointed out, they cannot therefore be explained on the basis of fatigue. They seem to be somehow directly related to the subject's motivation in the experiment. The first response in the run, for instance, is the one which is least likely to be rationally determined. It represents a fresh beginning, and rational bases of choice are less likely to be in operation here than at other points further along in the sequence of trials.

Similar position effects have also been found in the data of tests of psychokinesis, or PK. If anything, the tendency of subjects to concentrate their successful scoring at the start of a sequence of trials, such as a column or a set of throws for a single target face, is even more marked in PK records than in ESP data. This was first brought out in the report of Rhine and Humphrey (4) dealing with the quarter distribution of successes within both the page and the set. More recently Pratt (3) has subjected some of the PK records to a more intensive study of the distribution of successes and has found an even higher concentration of successes at the beginning of the page or set than had been previously suspected. These findings suggest that the factor with which we are here concerned and which has for convenience been termed "spontaneity" is one which characterizes parapsychological or psi functions in general.

The present investigation, however, is primarily concerned with the role of spontaneity in ESP. The aim of the research was to set up one situation in which the subjects' responses were spontaneous according to the accepted dictionary definition of the term and to contrast the results obtained under these conditions with other tests in which spontaneity was reduced to a minimum. The tests used were designed and presented to the subjects as tests of clairvoyance, but they did not exclude the possibility of precognition.

Interest in the problem of spontaneity arose as the result of some experimental observations which were made in 1940 and 1941. At that time a self-testing ESP apparatus known as the Marble Machine (described in more detail below) had just been completed. The writer shared in the design and construction of this testing device and was naturally eager to find out how successfully it could be used as a means of demonstrating ESP. In a number of off-the-record trial runs which were made with this machine, members of the Parapsychology Laboratory and their friends and acquaintances were used as subjects. No special effort was made to select outstanding subjects, and the results, as a whole, were not statistically significant in any way. It was observed, however, that in many instances the subjects were more successful on their very first trials, and it occurred to the experimenter that perhaps this was due to an initial spontaneity which was not sustained as the tests progressed. On the strength of these observations, it was decided to carry out a series of tests to determine experimentally whether the rate of scoring could be improved by restricting the subject to one trial at a time, with instructions designed to insure that the responses would be made with as much spontaneity as possible.

General Plan of Research

The purpose of this exploratory research was to study the relative effects of spontaneity and nonspontaneity on scoring in clairvoyance tests. In the "spontaneous" series the subjects were asked to make only a few trials a day and to make those only if they had a definite "hunch" or impression obtained without deliberation or conscious effort. In the "control" series, in which spontaneity was presumably at a minimum, the subjects were asked to make either single trials with deliberate, rational choice, successive trials in the same manner, or successive trials with no specified mode of response.

In setting up an experiment bearing on this problem of spontaneity, the first requirement appeared to be one of finding a test situation which would be as simple as possible from the point of view of the subject's task. It seemed desirable, therefore, to use self-testing devices which would automatically eliminate sensory cues and other sources of error. After the subject became familiar

with the apparatus itself, it would be possible for him to participate in the test when he was completely alone. Also, the use of the self-testing apparatus would make it possible to have members of the Parapsychology Laboratory and their friends participate as subjects in the various experimental and control series. For each of the experimental series the apparatus was placed where it would be seen frequently, and the subjects were asked to make only one trial at a time when they felt an impulse as to the correct choice. Once the subject had familiarized himself with the procedure, he could make a response whenever he felt that he could do so in accordance with the instructions.

Several different types of control series were used in this experiment: in one series the subjects were asked to make only one trial at a time with conscious effort and deliberation; in other control series the subjects were asked to make at least 25 trials in a session in accordance with certain instructions which will be given in detail below.

Two different self-testing devices were used in this research. Both of them provided a test of the subject's ability to identify by extrasensory perception one of five colors: red, white, blue, yellow, and black. The description of each self-testing device, the procedure followed with each, and the details of the series in which they were used will be given in the following sections.

Marble Machine

Description of the Apparatus

The Marble Machine (Fig. 1) consists of a large, hollow ball fastened atop a mechanism which is operated by the subject. In this ball is placed a random selection of marbles taken from a stock of 1,000 (200 of each of the five colors). The top half of the ball is hinged so that it may be opened for loading, and it is also equipped with a lock to prevent sight or manipulation of, or access to, the marbles after loading. On the front of the machine are five keys which correspond in color to the marbles used.

As the keys are pressed, a collector inside the ball at the bottom stirs the marbles, collects them, and deposits them one at a time in a vertical tube which descends from the center of the collector. At

the same time a horizontal slide moves the bottom marble from the vertical tube and drops it into an inclined runway which branches off into the five channels. The channel into which the marble rolls is directly above the key which is pressed. A hit is achieved when the marble which rolls down matches the color of the key which was pressed. Each channel is painted to match the color of the key which operates it, and the channels are covered with glass so that the subject may observe the results.

The construction of the machine makes it fraudproof under the general circumstances in which it was used. The glass cover is fastened down so that the subject cannot gain access to the marbles which have been "played." Futhermore, the cover fits closely and the marbles cannot be shaken from one channel to another. By the time a marble becomes visible, it is already committed to its designated channel. Safety features prevent the subject's rolling the marbles back up one channel and down another by tilting the machine.

When 25 trials have been completed, the machine automatically locks and the keys cannot be pressed again until a release button on the top of the machine is pushed. After the score for the run of 25 trials has been counted, this button is depressed so that it opens a gate at the bottom of all five channels and allows the entire run of 25 marbles to enter five separate chambers at the bottom of the machine. The marbles can be removed and counted, one chamberful at a time, by unlocking a door at the rear.

General Procedure

The procedure differed somewhat in the various series in which the Marble Machine was used, but the general plan may perhaps be understood best if the procedure followed in one of the spontaneous series is described in some detail first. (In a later section each series will be discussed separately.)

For loading the Marble Machine, the experimenter thoroughly stirred the stock of 1,000 marbles and selected from this supply the number required for the series. These were poured into the reservoir of the apparatus, and the experimenter then reached in without looking and turned the collector at the bottom of the supply of

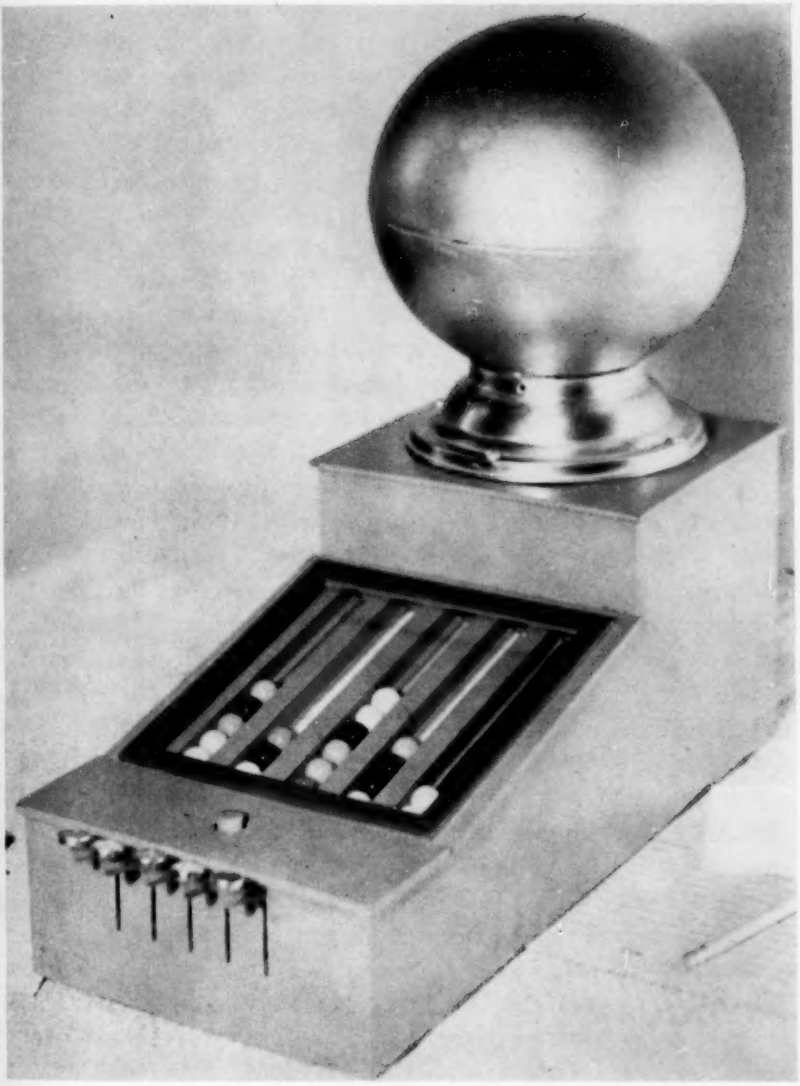

FIG. 1. Marble Machine.

marbles until the vertical tube was full. The globe was then shut and the cover was locked in position.

Explicit instructions were typed out and pasted on a piece of cardboard that fitted over the glass panel of the Marble Machine and concealed the channels and any marbles that they might contain. It was hoped that if the marbles already "played" were concealed, the subject's tendency to be rational in arriving at his response would be minimized.

The instructions enjoined the subject to make each trial only if a particular color flashed into his mind immediately upon seeing the apparatus or upon his first thinking of it when in its vicinity. The subject was directed not to make a trial if he felt the slightest hesitation about what his response should be, but to take part in the experiment only on those occasions when he felt a definite impulse or "hunch" with regard to a particular one of the five colors. Only one trial was permitted at a time and only a few trials were allowed during a day. The directions also required that the subject be thoroughly familiar with the operation of the machine before making his first trial.

After each response on the machine the subject was permitted to lift the shield and check on his result by looking at the top marble in the column of his choice. In the first experimental (spontaneous) series with this machine no individual records of the subjects' results were kept. In the other experimental series the subject was required to record on a form beside the machine what his choice and result were.

In all series, both experimental and control, the writer and another member of the Parapsychology Laboratory shared the responsibility in checking all the results. The Marble Machine was unlocked only in the presence of the two checkers. Each made independent counts of all marbles appearing in each channel. The records were then compared to see that the trials and hits agreed. Each checker kept his own results in his custody until the final analyses of all series were made.

Experimental (Spontaneous) Series

The experimental series in which the Marble Machine was used are designated by the letters "MM" followed directly by a number indicating the chronological sequence.

Series MM-1. This series was carried out in 1942 with the apparatus set up in the reception room of the Parapsychology Laboratory and with the invitation to participate as a subject open to anyone who would conform to the instructions. Most of the trials were made by members of the Laboratory. The instructions were for the subject to participate only if he had an impulse to choose one certain color and to make not more than two or three such responses, widely separated, in any one day. The subject was told that if he felt the slightest hesitation, he was not to make a response.

Series MM-2. In this series, carried out in 1947, 13 subjects[1] selected from members of the Parapsychology Laboratory were limited to 10 trials each. The instructions for this series were essentially the same as those for MM-1.

Control Series

As with the experimental series, the letters "MM" in the names of the control series indicate the use of the Marble Machine. The letter "c" in the name of each of the following series serves to designate it as a control (nonspontaneous) series.

Series MMc-1. This control series is the work which has already been reported by Humphrey and Pratt (1) as a part of their experiment comparing five ESP conditions. The subjects employed were college students, chiefly undergraduates, who volunteered for the experiment. As a rule each subject did 250 trials, or 10 runs, at a session. Their method of response was a matter of their own preference: they were not told to act on impulse or to deliberate, but merely to respond on whatever basis they thought best.

This series and the one to be described next were not originally designed to serve as controls for the present investigation. However, it seemed desirable to include them as controls in order to be able to compare the spontaneous data with all results from the Marble Machine in which there had been no attempt to secure

[1] This series originally consisted of only 10 subjects, but it was desired for purposes of future analysis to have the same subjects for a later control series. Since three members of the original 10 were by then no longer available, a subseries of three new subjects was run. Before this subseries was carried out, it had been planned to include all the spontaneous work in the final results, and since the conditions were alike in both the original and the subseries, the data were pooled for simplicity.

"spontaneous" responses in the sense defined for Series MM-1 and MM-2.

Series MMc-2. This is work done by the present investigator with the Marble Machine in 1941. The subjects in the series were also college students, and each subject usually did five runs at a session. As in the Humphrey-Pratt series, the subject was free to choose his own method of response.

Series MMc-3. In the third control series 10 subjects available from the MM-2 series each did 25 trials in one session under the

Table 1

CHART SHOWING CHARACTERISTICS OF VARIOUS SERIES

A. Marble Machine

Designation of Series	Date	Target	Type of Response	Frequency of Response per Subject
MM-1	1942	Colored Marble	Spontaneous	0-3 daily
MM-2	1947	Colored Marble	Spontaneous	0-3 daily
MMc-1	1941	Colored Marble	Free	250 per Session 2 Sessions
MMc-2	1941	Colored Marble	Free	125 per Session 1 Session only
MMc-3	1947	Colored Marble	Deliberate	25 per Session 1 Session only
MMc-4	1947	Colored Marble	Deliberate	0-3 daily

B. Hunch Box

Designation of Series	Date	Target	Duration of Target	Type of Response	Frequency of Response per Subject
HB-1	1946	Name of a color	1 day	Spontaneous	0-1 daily
HB-2	1947	Colored Marble	4 days	Spontaneous	0-3 daily
HBc	1948	Colored Marble	1 Response	Deliberate	22 First Session 25 Last Session

verbal instructions to deliberate carefully before each trial and to make sure that each color was the one he wanted to play before making his responses. The experimenter was present as an observer during these runs.

Series MMc-4. The same 10 subjects used in the MMc-3 series were used again for this control in which the trials were made one at a time as in the experimental series, but with careful deliberation and conscious choice of the color before the response. This series is particularly important because it bears on the question of whether the mere restricting of the subjects to one trial instead of a whole run is the important factor present in the conditions of the experimental series.

Moreover the subjects were asked *not* to make a response if they had an impulse or sudden "hunch" to choose one color. Only two or three trials were permitted on any one day.

The essential details of all series in which the Marble Machine was used are summarized for easy reference in Section A of Table 1.

The Hunch Box

Description of the Apparatus

The second self-testing device is called the "Hunch Box." It consists of a small, gray, cubical box 4½ inches on each edge and open at the bottom. Within this is a smaller box, open at the top and locked in position from underneath. The two boxes when thus fitted together give the effect of a closed cube. In the top of the outer box is a hole ⅝ of an inch in diameter into which the subject may drop marbles. During the experiment the outer shell of the box was fastened to the wall just inside the door of the Parapsychology Laboratory. The inner portion may easily be removed for purposes of loading and checking. (See Fig. 2.)

The Hunch Box served as a depository for a target color which each subject was to try to match by placing in the box a marble of the same color.

Baffles were placed directly beneath the hole in the box to remove the possibility that anyone, by the use of a light, could look into the box and determine the color of the target or any of the response marbles which had been dropped in.

In the two experimental series with the Hunch Box a reservoir of marbles was placed on the wall beside the box so that the subject could pick out the color of his choice. This reservoir was made of five vertical chambers, each of which held 10 marbles of a particular color. Only the bottom marble in each of these chambers or columns was visible. When the bottom marble from one of the columns was removed by a subject, another of the same color

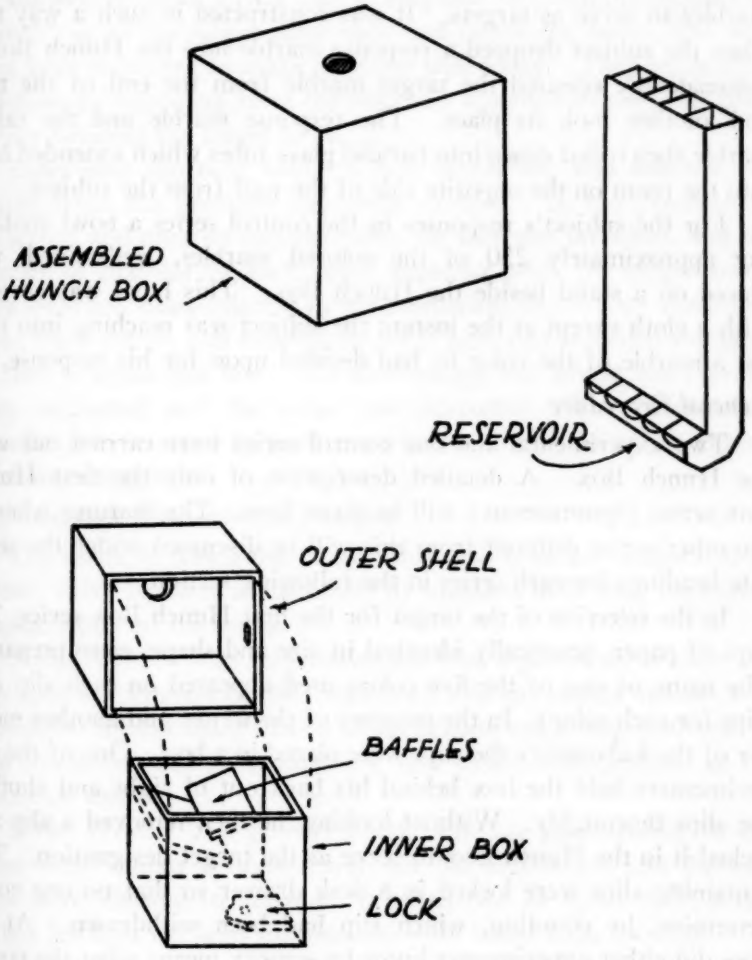

FIG. 2. Hunch Box for spontaneous series.

would appear in its place. To minimize the effect of any position preference a subject might have, the colors of the marbles in the chambers of the reservoir were rotated daily by the experimenter.

For the one control series with the Hunch Box the apparatus was modified to present a randomly selected target for each response. In the room just back of the box a brass tube was inserted through the wall into the Hunch Box just far enough so that the end marble in the tube was inside the box. The tube held 25 randomly selected marbles to serve as targets. It was constructed in such a way that when the subject dropped a response marble into the Hunch Box it automatically released the target marble from the end of the tube and another took its place. The response marble and the target marble then rolled down into parallel glass tubes which extended back into the room on the opposite side of the wall from the subject.

For the subject's responses in the control series a bowl containing approximately 250 of the colored marbles, well-mixed, was placed on a stand beside the Hunch Box. This bowl was covered with a cloth except at the instant the subject was reaching into it to get a marble of the color he had decided upon for his response.

General Procedure

Two experimental and one control series were carried out with the Hunch Box. A detailed description of only the first Hunch Box series (spontaneous) will be given here. The features wherein the other series differed from this will be discussed under the separate headings for each series in the following section.

In the selection of the target for the first Hunch Box series, 100 slips of paper, practically identical in size and shape, were prepared. The name of one of the five colors used appeared on each slip (20 slips for each color). In the presence of the writer and another member of the Laboratory the slips were placed in a box. One of the experimenters held the box behind his back out of sight and shuffled the slips thoroughly. Without looking, he then removed a slip and locked it in the Hunch Box to serve as the target designation. The remaining slips were locked in a desk drawer so that no one could determine, by counting, which slip had been withdrawn. At no time did either experimenter know by sensory means what the target for the day was.

A new target slip was placed in the box early every morning during the week. The target slip placed in the box on Saturday morning, however, remained there over the week end until Monday morning.

The instructions to the subjects were similar to those given in the spontaneous series with the Marble Machine. In addition to the written instructions general oral directions were given asking the subjects to make a trial only in response to a definite impulse or "hunch" as to the target color indicated inside the box. The subjects were requested to make only one trial a day. They made their responses by removing from the reservoir a marble of the same color as they believed the target to be.

Early each morning before a new target slip was selected, the results from the previous day were counted. In the presence of the writer and another experimenter, the box was unlocked, and the number of marbles of each color, together with the target color, were recorded independently by each experimenter. They then compared their entries and checked to see if both had recorded the same number of trials and hits. If a discrepancy was found, the marbles were recounted and the error was corrected. The independent records were retained by each experimenter until the entire experiment was completed.

Experimental (Spontaneous) Series

The series in which the Hunch Box was used are designated by letters "HB" followed immediately by numbers indicating the chronological order of the series.

Series HB-1. This series extended over a period of 60 days and was open to members of the Laboratory and any casual visitors who considered themselves qualified to participate under the instructions. The conditions and procedures for this series were outlined in the preceding section.

Series HB-2. The general instructions for participating in this series were similar to those given for the first series, and the subjects were allowed to make as many as two or three trials a day if they felt that the later impressions were better than the first.

On the basis of certain findings in Series HB-1 it was decided to leave the same target in the box for four days before the checkup

and change of target in Series HB-2. (The subjects were not told of this change until the series was completed, and all assumed that the target was changed daily as in the first series.)

There was another feature in which the second series differed from the first. Instead of designating the target by the name of a color, as in Series HB-1, a marble was placed in a glass capsule and this was placed inside the Hunch Box as the target. The target selection was made in the presence of two experimenters. One marble of each color was placed in a box. Holding the box behind his back, one experimenter then shook up the marbles and withdrew one, placing it in the glass capsule. Without looking at the marble, he then locked the capsule into the Hunch Box and replaced the four remaining marbles in the general stock. Care was taken that nobody saw either the target marble or the four marbles not selected. The two experimenters alternated in the task of selecting the target, and each faced the other throughout the process.

The recording of trials and the counting of hits was done in exactly the same manner as for Series HB-1.

In Series HB-1 it was noticed that with the passage of time the number of responses made daily began to decrease. The writer attributed this to the probability that for the subjects the Hunch Box became as one of the other furnishings of the room and was noticed less and less from day to day. In an attempt to offset this feature of the first series various attention-getting devices were employed in Series HB-2 in the hope that, by the constant change, the subject's interest, and therefore his spontaneity, would be increased. For the most part these devices were humorous signs of different sizes, shapes, and wording.

This series lasted for a period of 24 days, and the participating subjects were essentially the same as those who took part in the first series.

Control Series

Only one series of control trials was carried out with the Hunch Box, Series HBc. It was in this series that 25 marbles in the brass tube served as targets. A similar brass tube was loaded by a second experimenter, a member of the Laboratory staff, by using a random selection of 25 marbles from the large stock of marbles used for the

Marble Machine. In his own room the second experimenter loaded the tube without looking at the marbles. He then took the tube into the room behind the Hunch Box and poured the marbles into the stationary brass tube which extended through the wall into the Hunch Box and placed a cover over the open end of the tube. Only one marble in the tube projected into the Hunch Box. The door of the room into which this tube projected was kept locked from the time the tube was loaded until the completion of each session.

The subjects were selected from among the members of the Parapsychology Laboratory and others of the community who were known to have participated prominently in the two spontaneous series with the Hunch Box. Each subject was given two sessions, the first consisting of 22 trials[2] and the second of 25 trials. Verbal instructions were given to the subject to deliberate carefully as to which color he thought the target marble was before he chose a marble from the bowlful provided for making his responses (as discussed in the description of the apparatus). The subject was asked not to follow his hunches but to make a response only after careful deliberation.

At the end of each subject-session the parallel glass tubes were removed by the writer in the presence of the subject. Both of them then went together to the room of the second experimenter. Each experimenter made an independent checkup, and independent records of the targets and responses were retained by each until the end of the experiment.

Section B in Table 1 summarizes for easy reference the essential conditions of all series, experimental and control, with the Hunch Box.

Results

Series MM-1 consisted of 8.08 runs (202 trials) which gave an average score per run of 7.18 hits. These results give a critical

[2] Actually each subject made 25 trials in the first session also, but the experimenter had indicated in writing before the series was begun that the first three trials would not be counted. It was felt that the first trials with the new apparatus might contain a large element of spontaneity. A statement of this intention to eliminate three trials of each subject was deposited with the Record Librarian of the Laboratory before the series was started. As it turned out, this procedure proved to have been unnecessary, for the rate of scoring on these first trials was approximately the same as that for the rest of the trials.

ratio of 3.10 (P = .00097). Series MM-2, which was done with a pre-assigned length of 130 trials, gave an average of 7.12 hits per run, the CR being 2.41 (P = .008). The total of the spontaneous work with the Marble Machine consists of 13.28 runs with an average of 7.15 hits per run. This gives a CR of 3.92 (P = .00004).

The control series with the Marble Machine, on the other hand, yielded only results readily attributable to chance. Series MMc-1, the Humphrey-Pratt work of 1941, consisted of 287 runs which gave an average of 4.87 and a CR of −1.09. Series MMc-2, conducted by the present writer in 1941, consisted of 90.4 runs which averaged 5.19 and had a CR of .98. Series MMc-3 consisted of 10 runs which averaged exactly 5.00. Series MMc-4 consisted of four runs which gave an average of 4.25, with a CR of −.75. All of the control series together add up to 391.4 runs with an average of 4.94. The CR of this pooled result is −.54 and has no statistical significance.[3]

The difference in average score between all of the experimental and the control series done with the Marble Machine is 2.21 hits per run. This difference has a CR of 3.97 (P = .000036). The result is therefore statistically significant and supports the hypothesis that the conditions of the spontaneous series are more favorable for ESP scoring than those of the various control series.

All of the results obtained with the Marble Machine are summarized in Table 2.

In the spontaneous series with the Hunch Box a single target was always used for a number of responses. This introduces a possibility, which in previous articles has been termed a "stacking effect" but which might be more appropriately termed in this instance a "herd effect." This is a possible tendency on the part of a number of subjects to make the same call on the same day or in response to the same target. If the responses made to a given target show a decided preference for one or two colors, this will result in an ab-

[3] It will be noted that, in two of the four control series, below-"chance" scores resulted. In order to make the data for the control series strictly comparable with those of the spontaneous series, the value of P given for these series has been taken as the probability of a CR algebraically greater than that actually obtained.

Table 2

SUMMARY OF RESULTS OBTAINED WITH MARBLE MACHINE

A. Spontaneous Series

Series	MM-1	MM-2	Total
Runs	8.08	5.2	13.28
Average Run-Score	7.18	7.12	7.15
CR	3.10	2.41	3.92
P	.00097	.008	.00004

B. Control Series

Series	MMc-1	MMc-2	MMc-3	MMc-4	Total
Runs	287	90.4	10	4	391.4
Average Run-Score	4.87	5.19	5.0	4.25	4.94
CR	−1.09	.98	0.0	−.75	−.54
P	.86	.17	.5	.77	.71

The CR of the difference between the Spontaneous Series and the Control Series is 3.97, with P = .000036.

normally large number of hits if one of these colors happens to be selected as the target, or an abnormally small number of hits otherwise. This means that large deviations, both positive and negative, will be more likely than if the calls of the different subjects were strictly independent of one another, and the variance of the distribution of hits will exceed the value obtained by the usual binomial formula which assumes such independence. Accordingly, in computing the CR the variance was obtained by a special formula[4] which takes into account any preference (or aversion) shown for particular calls in response to each target.

Series HB-1 consisted of 22.16 runs and yielded an average of only 4.96 hits per run, which is very close to mean chance expectation. These results, when evaluated by the appropriate method indi-

[4] This formula and its mathematical derivation are given by T. N. E. Greville in his article "On Multiple Matching with One Variable Deck," in the *Annals of Mathematical Statistics*, 1944, **15**, 432-434.

cated in the preceding paragraph, yielded a CR of −.09 (P = .54). In the course of checking the results of this series, however, the experimenter noted that there was a marked difference between the results obtained on the week end when the target designation was left in the box for two days and those obtained during the week when it was changed every day. The trials made on the week end contributed 3.56 runs, which averaged 7.30 hits per run, whereas trials made on the week days, consisting of 18.6 runs, averaged only 4.52. No statistical significance may be attributed to this result because of its being completely unanticipated, but it did suggest to the experimenter that the length of time during which the same target was left in the box was an important factor. Series HB-2 was planned, therefore, to follow out this suggestion, and during this new series each target was left in the box for four full days.

The results of Series HB-2 add up to 13.2 runs, which average 6.36 hits per run. In this case also the SD was computed by the method which is appropriate for records involving multiple choices for each target. By this method, the results of Series HB-2 gave a CR of 1.56 (P = .06). While the rate of scoring was above that of Series HB-1 in general and compared closely with the week-end results of that series, the series as planned was so short that the results did not reach the .01 level of significance.

The HBc Series, the control work with the Hunch Box in which each trial had its individual target and in which each subject made 22 or 25 trials at a time, consisted of 20.68 runs. The average was 4.83 hits per run, and the CR was − .37, which is statistically of no significance.

The comparison between the spontaneous and control trials of the Hunch Box does not give a statistically significant result. The most interesting comparison is that between HB-2 and HBc. This comparison gives a CR of 1.56 (P = .06), which has only suggestive value.

All the results obtained from the Hunch Box are summarized in Table 3.

It is important to get some measure of the significance of all of the experimental series considered as a whole. In view of the fact that different methods of evaluation were used for the different

Table 3

SUMMARY OF RESULTS OBTAINED WITH HUNCH BOX

	SPONTANEOUS SERIES		CONTROL SERIES
Series	HB-1	HB-2	HBc
Runs	22.16	13.2	20.68
Average Run-Score	4.96	6.36	4.83
CR	.09 [P=.54]	1.56 [P=.06]	−.37 [P=.64]

The CR of the difference between Series HB-2 and HBc is 1.56, with P = .06.

series, the best way of evaluating the series together seemed to be Fisher's method for combining probabilities of independent results (5, pp. 386-87). This method was applied to the statistically independent probabilities derived from Series MM-1, MM-2, HB-1, and HB-2. This evaluation gives a chi-square value of 30.43 with 8 degrees of freedom (P = .0002). Thus, the combined experimental results obtained under the conditions which fostered spontaneity proved to be highly significant. In contrast, none of the control series, either singly or in combination, yielded results which could not be readily ascribed to chance.

DISCUSSION

Evidence for ESP

The first question to be decided, of course, is whether the results of the experimental series justify the conclusion that ESP has been demonstrated. The hypothesis of chance seems to be effectively disposed of by the results of combining the probabilities of the independent experimental series. This gives a combined probability of .0002 for all of the spontaneous trials, and the results therefore satisfactorily exceed the .01 criterion of significance and justify the conclusion that the chance hypothesis cannot explain the findings.

The nature of the problem under investigation made it necessary to gather data very slowly. For this reason the number of trials made in the spontaneous series is smaller than is customary for an ESP test. The length of series adopted in planning the different steps of the procedure represented what seemed to be the best pos-

sible compromise. On the one hand, if the number of trials had been much smaller, there was a danger that the results would not have been statistically significant. On the other hand, the use of longer series might have made the subjects less spontaneous and thus might have inhibited the very factor the experiment was designed to test.

The next question is whether any other counterhypotheses to ESP, considered either singly or in combination, could account for the results. The methods of eliminating sensory cues were largely incorporated in the self-testing devices, and they have already been described. There was no way in which the subject could either consciously or unconsciously make use of knowledge obtained through the senses to improve his score. The experimenter carefully avoided obtaining any knowledge of the order of the stimuli in the tests and thus removed the possibility that he might give the subject any cues to the correct response. The procedure for loading the Marble Machine was particularly adequate in this regard. Inasmuch as the results with the Marble Machine contributed the major share to the statistical significance of the findings, it is very reassuring to know that the experimenter could not have unwittingly assisted the subjects to get their high scores.

The question of recording errors and lost records has also been adequately taken care of by the procedure. Two experimenters were always present when the apparatus was unlocked for checking the results, and each made independent counts of the hits in the presence of the other. The records were then compared to see that the trials and hits agreed. Each experimenter kept his own results in his custody until the final analyses were made.

Comparable care was used in making analyses and computations in preparing the results for publication. Every step was done by two persons working independently from different records of the original data.

In view of the above precautions incorporated in the experimental procedure, none of the counterhypotheses available seems adequate to explain the results. The only alternative explanation in the light of present knowledge would seem to be extrasensory perception.

Spontaneity

Aside from the evidence for the occurrence of ESP, there remains to be considered what factor or factors account for the difference in scores obtained under the spontaneous and the control (nonspontaneous) conditions. Earlier investigations have shown that subjects can score positively or negatively at will. It is conceivable that in this case the subjects surmised what hypothesis the experimenter was favoring and out of kindness or consideration for him caused the results to deviate according to hypothesis. This is an explanation which cannot be completely ruled out on the basis of the present research. The object of this investigation, however, has been merely to proceed operationally to set up a hypothesis defined in terms of the conditions employed in the experiment and to see whether the predictions made were supported by the results. This objective has been fully realized.

The question of the nature of spontaneity is an important one to consider, though it may not be possible to give a full and final answer on the basis of this research. A spontaneous response may perhaps best be described as one which is made with a minimum of conscious effort on the part of the subject. The choice seems to be one which is simply *presented* to the subject, rather than being actively sought by him. It is interesting to recall in this connection that Thouless and Wiesner (7) advanced the view that psi responses, particularly those of ESP, appear to be facilitated by an absence of effort on the part of the subject, and that trying to get an ESP impression may strengthen the tendencies to respond in terms of the more familiar forms of perception and cognition. The results of the present investigation lend further support to their position.

These subjects scored significantly only when they restricted their responses to a single trial at a time, but their success was not merely a matter of having their trials separated. In one of the control series with the Marble Machine (MMc-4) the subjects used were individuals who had taken part in a spontaneous series (MM-2). In these two series their trials were separated from one another in the same way. The only difference, therefore, would appear to be that of the subject's state of mind brought about by the instructions. With the instructions to respond only when a

definite impulse or hunch was felt, the results were significant. With the nonspontaneous instructions to deliberate carefully and make sure of their choice before making a trial, however, the subjects obtained only chance results. The difference seems to be attributable only to the subjective factors produced by the two sets of instructions.

There have been calls from many quarters for an infallibly repeatable ESP experiment. Any research involving subtle psychological factors which are continuously interactive and always changing, often imperceptibly, may, however, be difficult to force into this arbitrary criterion of scientific progress. The effort here has been toward obtaining evidence of extrasensory perception in as simple and unaffected a psychological situation as possible in the hope that the many everyday cognitive associations and rational impulses would not inhibit this function. The most important feature about the findings is the fact that subjects who were not successful otherwise did demonstrate ESP ability under the special conditions provided by the spontaneous series. It remains to be seen whether these results can be repeated, and if so, under what variations of the conditions. Can the same experimenter continue to get comparable results with the same subjects, or would he now need to use new, and possibly naïve, subjects? More important still, can other experimenters get similar results by following the same general procedure?

In comparison with most other ESP test procedures these investigations have been long-drawn-out and quite tedious and laborious for the experimenter, but they have been just the opposite for the subjects. It would, naturally, be desirable to shorten the period covered by the investigations and to collect more data if this could be done without defeating the main purpose of achieving significant scoring through spontaneity of responses. We must avoid the temptation to dictate to nature in regard to how we would like her phenomena to appear. Rather, we must be willing to study her occurrences as they are, willingly making personal sacrifices or accepting any inconveniences that may be necessary. This principle applied to the further experimental study of the role of spontaneity in ESP means that we should begin with the present findings

and explore carefully out from the secure mooring which these facts provide. On the one hand, we need to find out whether the spontaneity factor can be retained when the subjects are allowed to make more responses at shorter time intervals. On the other hand, it is important to see if still higher scores might be obtained by making the conditions even more favorable for spontaneous responses, such as by permitting each subject to make even fewer choices in each series and by having the trials even more widely separated in time.

References

1. Humphrey, B. M., and Pratt, J. G. A comparison of five ESP test procedures. *J. Parapsychol.*, 1941, **5**, 267-93.
2. Jephson, I. Evidence for clairvoyance in card guessing. *Proc. Soc. psych. Res.*, Lond., 1929, **28**, 243-71.
3. Pratt, J. G. Restricted areas of success in PK tests. *J. Parapsychol.*, 1947, **11**, 191-207.
4. Rhine, J. B., and Humphrey, B. M. The PK effect: special evidence from hit patterns. II. Quarter distributions of the set. *J. Parapsychol.*, 1944, **8**, 254-71.
5. Rhine, J. B., Pratt, J. G., Stuart, C. E., Smith, B. M., and Greenwood, J. A. *Extrasensory Perception After Sixty Years.* New York: Henry Holt, 1940.
6. Smith, B. M., and Gibson, E. P. Conditions affecting ESP performance. *J. Parapsychol.*, 1941, **5**, 58-86.
7. Thouless, R. H., and Wiesner, B. P. Psi processes in normal and "paranormal" psychology. *Proc. Soc. psych. Res.*, Lond., 1947, **48**, 177-96.

Parapsychology Laboratory
Duke University
Durham, North Carolina

COMMENTS

INDEPENDENT DISCOVERIES OF TARGET PREFERENCE IN PK DATA

SIMULTANEOUS discovery or invention by two independent workers has often been reported in the past. Now we have a good example of such a coincidence from parapsychology itself—one that occurred recently between two independent investigators, neither of whom was aware that the other was working on the same problem. This double discovery was concerned with the question of whether the PK subjects' preferences for different faces of the die affect the scoring rate; or, in other words, whether *mental* bias concerning the die faces is a factor in the PK tests. The research workers have given some thought to this question since the beginning of the PK investigations, and for a long time it did not seem possible to get a clear-cut answer with the data available. Then, rather abruptly it appears, there occurred two entirely independent demonstrations of a psychological effect of the target in PK results, one in America and the other in Britain.

While it is not possible to say just how nearly simultaneous these duplicate discoveries were, it is clear that they were completely independent, and the evidence points to their having been made at about the same time—certainly not more than a few weeks apart. This fact is not cited as a case of telepathy between the two research workers, Mr. Carington and Dr. Pratt, but twelve years after the dice tests of PK began, two individuals independently produced similar findings within a few weeks of each other. This occurrence, to say the least, does represent an interesting example of the logical pattern often shown in the advance of science.

The American study, reported by J. G. Pratt in this JOURNAL in March, 1947, showed that a highly significant pattern of hit distribution occurred in the data of a major PK subject when she was using the three higher faces of the die as targets, but not when the three lower faces were scored. The evidence was based upon an

incline in scoring within the column, which showed the hits made on six successive trials. With the larger numbers as target, the increase in success from the beginning to the end of the column gave results with odds against chance of about a billion to one. With the lower faces as target, there was no increase in success. As the same target was used throughout the column, the difference in position effects could not be attributed to dice bias.

In the British study carried out and reported cooperatively by Nicol and Carington (*Proceedings of the Society for Psychical Research,* May, 1947), Carington made an analysis of the relative success in PK tests with the higher and lower faces of the die as targets. The data were obtained from eight subjects, each of whom threw 600 runs, a total of 115,200 die readings for the entire series. All of the die faces turned up on each throw were recorded—not merely the target face. Having the records of all the faces, these investigators were able to take a different approach to the problem of the psychological effects of the targets. Their analysis was based upon the frequency with which the different faces turned up when each face was used as target, and the method of evaluation corrected fully for any differences due to imperfect dice. The results showed that there was an excess of hits when the three higher faces were the targets, but an actual deficiency when the three lower faces were used. The four-, five-, and six-faces were favored over the three lower ones in the scoring to a degree that would be expected by chance only 27 times in 10,000 such series.

The Nicol and Carington study, incidentally, is the second experiment confirming the PK effect which has been reported from England. (The first one was the coin-spinning test of Professor Thouless which appeared in this JOURNAL in September, 1945.) The target factor which they found was identical with that shown in the Pratt report from America, a higher rate of success when throwing for the higher faces of the die. Such agreement between independent investigators not only affords weighty evidence of the occurrence of PK, but it also confirms the general character of the role of preference as a factor in PK.

The target preference effect is not as yet fully understood. Further research may show that the explanation lies in the different interest values of the target numbers, in favorable motivation growing out of relative success in scoring early in the test, or in still other factors. The important point is that the target differences found are psychological in character and they therefore contribute to the growing body of evidence that is fitting psi capacities into the more familiar pattern of normal mental life.—Ed.

BOOK REVIEWS

THE RELIGION OF THE MODERN SCIENTIST (NEO-MATERIALISM), by S. W. Tromp. Leiden: A. W. Sijthoff's Uitgeversmij N. V., 1948. Pp. xxiv + 480.

This book, by a professor of Geology at Fouad I University in Cairo, expands a new world-attack, neo-materialism, which is intended to form the basis of a scientific religion. The main thesis is that energy is the fundamental reality; life is a crystalline phenomenon, and mind an electrical one. Most of the book consists of an encyclopedic survey of modern scientific knowledge, including the whole of human history down to the end of the second World War. A brief final chapter draws the moral and propounds "Ten Commandments for the Modern Scientist"; for example: "Admire energy"; "Promote socialism"; "Never try to counteract evolution."

In the course of the survey of modern science some twenty-five pages are devoted to parapsychology. There are also scattered references to the subject elsewhere. The author's attitude is interesting and unusual. He is ready, sometimes perhaps too ready, to accept the existence of the phenomena, though he often calls them by names which most English-speaking students of psychical research will find unfamiliar ("parapragmasy," for instance). On the other hand, his *explanation* of the phenomena is a completely materialistic one in terms of "brain waves" and the like; and this explanation, as he states it, is far too general to be convincing. But there is no doubt that students of psychical research ought to know more about the minute electrical charges which have recently been found to accompany brain processes; and they will find a useful summary of recent work on this topic in an earlier section of the book. They will also find a useful summary of experimental work on water-divining and on some other subjects, such as graphology and palmistry, which lie on the fringes of psychical research. There is a very full bibliography, though it is disconcerting to find that this JOURNAL is not mentioned in it; and the *Proceedings of the*

S.P.R. are not mentioned either, unless *"Proceedings of the National Laboratory of Psychical Research,* London" is intended to refer to them. There is also a very full index.

H. H. PRICE

SPIRITISM OR PARAPSYCHOLOGY? by Professor Alexander Spesz. Trnava, Slovakia: 1947.

This is a scholarly book by a professor of theology in a small Slovak town. The author tries to give a comprehensive account of the spiritualistic notions of our time and of the achievements of modern parapsychology. The report is written with considerable erudition; it contains most of the facts that were presented in the German, French, and Anglo-Saxon literature up to World War II. However, no attempt is made at a critical evaluation, no new views are presented, and the author avoids taking a definite stand in discriminating between the scientific approach of parapsychology and the emotionally colored beliefs of the spiritualists.

The report is interspersed with anecdotal accounts given to the author by the country folk in his community. They contain no material suggestive of psychical occurrences but would be classified as purely hysterical manifestations by the psychiatrist.

It is undoubtedly difficult to draw a strict border line between the morbid and the parapsychological. All the more should the student be aware of the danger of losing his bearings in these two adjacent or overlapping fields. He should certainly be anxious to avoid engaging in scientific field work while maintaining some of his leanings toward naïve folklore.

The absence of any reference to experimental work done at Duke University or to related researches is a striking shortcoming in a book on parapsychology that appeared in 1947. The omission is obviously due to the difficulties of communication—both sensory and extrasensory—between two badly divided parts of the world.

JAN EHRENWALD, M.D.

GLOSSARY

In order to avoid constant redefining of commonly recurring terms in papers appearing in this JOURNAL, the following definitions are submitted for convenient reference.

*For a simple description of those terms marked by an asterisk, as they apply to the ESP test data, see Chapter VIII and the Appendix of *A Handbook for Testing Extra-Sensory Perception* by C. E. Stuart and J. G. Pratt. Further explanation may be found in any elementary statistical text.

AGENT: In tests for telepathy, the person whose mental states are to be apprehended by the percipient. In GESP tests, the person who looks at the stimulus object.

AVERAGE SCORE: Average number of hits per run.

CALL v.: To attempt to identify by ESP a stimulus object or a mental state of an agent.

CALL n.: The response described above; also the resulting selection.

*CHANCE: The complex of undefined causal factors irrelevant to the purpose at hand.
CHANCE EXPECTATION = MEAN CHANCE EXPECTATION: The most likely score if only chance obtains.
CHANCE AVERAGE: Mean chance expectation expressed as an expected score, generally in terms of average per run.

CHI-SQUARE: A sum of quantities each of which is a deviation squared divided by an expected value. Also a sum of the squares of CR's.

CLAIRVOYANCE: Extrasensory perception of objective events as distinguished from telepathic perception of the mental state of another person.

*CR (CRITICAL RATIO): A measure to determine whether or not the observed deviation is significantly greater than the expected random fluctuation about the average. The CR is obtained by dividing the observed deviation by the standard deviation. (The probability of a given CR may be obtained by consulting tables of the probability integral, such as Pearson's.)
CR OF THE DIFFERENCE: The observed difference between the average scores of two samples of data divided by the standard deviation of the difference.

DECK: Twenty-five ESP cards, five of each suit.

*DEVIATION: The amount an observed number of hits or an average score varies from the mean chance expectation or chance average. A deviation may be total (for a series of runs) or average (per run).

DIE THROW: The elementary unit of data in a dice-throwing test represented by the throwing and reading of a single die, no matter how many dice are thrown at a time.

EMPIRICAL CONTROL: An experiment which wholly or partially follows the main experiment with the exception that the conditions are designed to exclude the possibility of the hypothesis being tested.

ESP (EXTRASENSORY PERCEPTION): Response to an external event not presented to any known sense.
ESP CARDS: Cards, each bearing one of the following five symbols: star, circle, three parallel wavy lines (called "waves"), square, plus.
ESP SYMBOLS: See plate opposite page 1, this JOURNAL, Vol. 1, March, 1937.

EXPECTATION; see CHANCE.

EXTRACHANCE: Not due to chance alone.

FREE MATERIAL: The stimulus objects of experiments in which an unlimited or unspecified range of stimulus objects is employed (as contrasted with methods such as card-calling in which the subject knows that the stimulus object is one of a known range).

FREE RESPONSE METHOD: An ESP test method in which a relatively unlimited range of stimulus objects is used and in which the subject is instructed to express freely as his response any range of thoughts and ideas.

GESP (GENERAL EXTRASENSORY PERCEPTION): A technique designed to test the occurrence of extrasensory perception, permitting either telepathy or clairvoyance or both to operate.

HIGH-DICE TEST: A PK technique in which the aim of the subject is to try to influence a pair of dice to fall with the two upper faces totaling eight or more.

LOW-DICE TEST: A PK technique in which the aim of the subject is to try to influence a pair of dice to fall with the two upper faces totaling six or less.

MEAN CHANCE EXPECTATION; see CHANCE.

*P (PROBABILITY): A mathematical estimate of the expected relative frequency of a given event if chance alone were operative.

PARAPSYCHOLOGY: A division of psychology dealing with those psychical effects which appear not to fall within the scope of what is at present recognized law.

PERCIPIENT: The person who makes the calls in an ESP test.

PK (PSYCHOKINESIS): The direct influence exerted on a physical system by a subject without any known intermediate physical energy or instrumentation.

PRECOGNITION: Cognition of a future event which could not be known through rational inference.

PREFERENTIAL MATCHING: A method of scoring free responses. A judge ranks the stimulus objects (usually in sets of four) with respect to their similarity to, or association with, each response; and/or he ranks the responses with respect to their similarity to, or association with, each stimulus object.

PSI: A general term to identify personal factors or processes in nature which transcend accepted laws. It approximates the popular use of the word "psychic" and the technical one, "parapsychical."

PSI PHENOMENA: Occurrences which result from the operation of psi. They include the phenomena of both ESP (including precognition) and PK.

QD (QUARTER DISTRIBUTION): The distribution of hits in the record page (or in a logical subdivision thereof, such as the set or the half-set) as found in the four equal quarters formed by dividing the selected unit horizontally and vertically.

RUN: A group of trials, usually the successive calling of a deck of 25 ESP cards or symbols. In PK tests, 24 single die throws regardless of the number of dice thrown at the same time.

SCORE: The number of hits made in one run.

TOTAL SCORE: Total of scores made in a given number of runs.

AVERAGE SCORE: Total score divided by number of runs.

•SD (STANDARD DEVIATION): Usually the theoretical root mean square of the deviations. It is obtained from the formula $\sqrt{npq}$, in which n is the number of single trials, p the probability of success per trial, and q the probability of failure. (For ESP cards, SD $= 2\sqrt{\text{no. of runs.}}$) Sometimes the SD used is that estimated from the observed variability in the scores.

SD OF THE DIFFERENCE: For both ESP cards and PK tests using dice, the SD of the difference is equal to $\sigma_s \sqrt{1/R_1 + 1/R_2}$ where σ_s is the SD of a single run and R_1 and R_2 are the number of the runs in the respective samples compared. This gives the SD of the difference for run score averages.

SERIES: Several runs or experimental sessions that are grouped in accordance with a stated principle.

SESSION: A unit of an ESP or PK experiment comprising all the trials of one test occasion.

SET: A subdivision of the record page serving as a scoring unit for a consecutive group of trials, usually for the same target.

SEVENS TEST: A PK technique in which the aim of the subject is to try to influence a pair of dice to fall with the two upper faces totaling seven.

•SIGNIFICANCE: A numerical result is significant when it equals or surpasses some criterion of degree of chance improbability. Common criteria are: a probability value of .01 or less, or a deviation in the expected direction such that the critical ratio is 2.33 or greater.

SINGLES TEST: A PK technique in which the aim of the subject is to try to influence dice to fall with a specified face up.

STIMULUS OBJECT: The ESP card or drawing or other object, some identifying characteristic of which is to be apprehended by the percipient.

TARGET: In ESP tests, the stimulus object; or in telepathy, the mental state of the agent. In PK tests, the faces of the die (or combination of faces) which the subject attempts to bring up in the act of throwing.

TARGET CARD: The card which the percipient is attempting to perceive (i.e., to identify or otherwise indicate a knowledge of).

SUBJECT: The person who is experimented upon. In ESP tests, most commonly the percipient (though also the agent in GESP and telepathy). In PK tests, any individual whose task it is to influence the objects thrown.

TARGET DECK: The deck of cards the order of which the subject is attempting to identify.

TARGET FACE: The face on the die which the subject tries to turn up as a consequence of direct mental action.

TELEPATHY: Extrasensory perception of the mental activities of another person. It does not include the clairvoyant perception of objective events.

TRIAL: In ESP tests, a single attempt to identify a stimulus object. In PK tests, a single throw of the dice or other objects thrown.